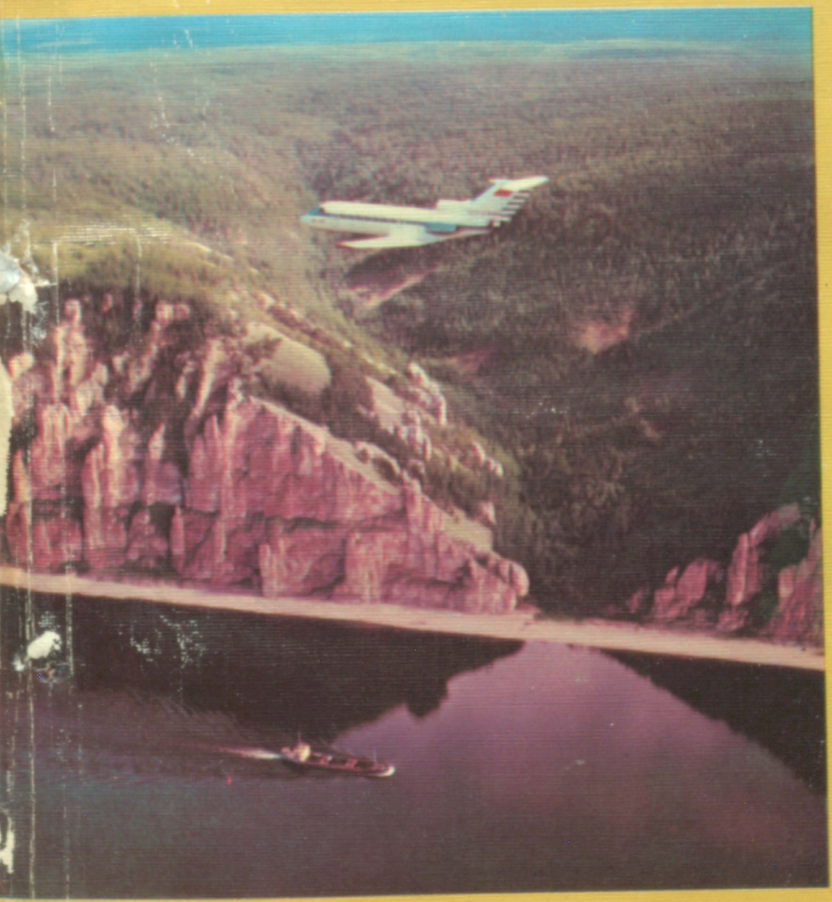
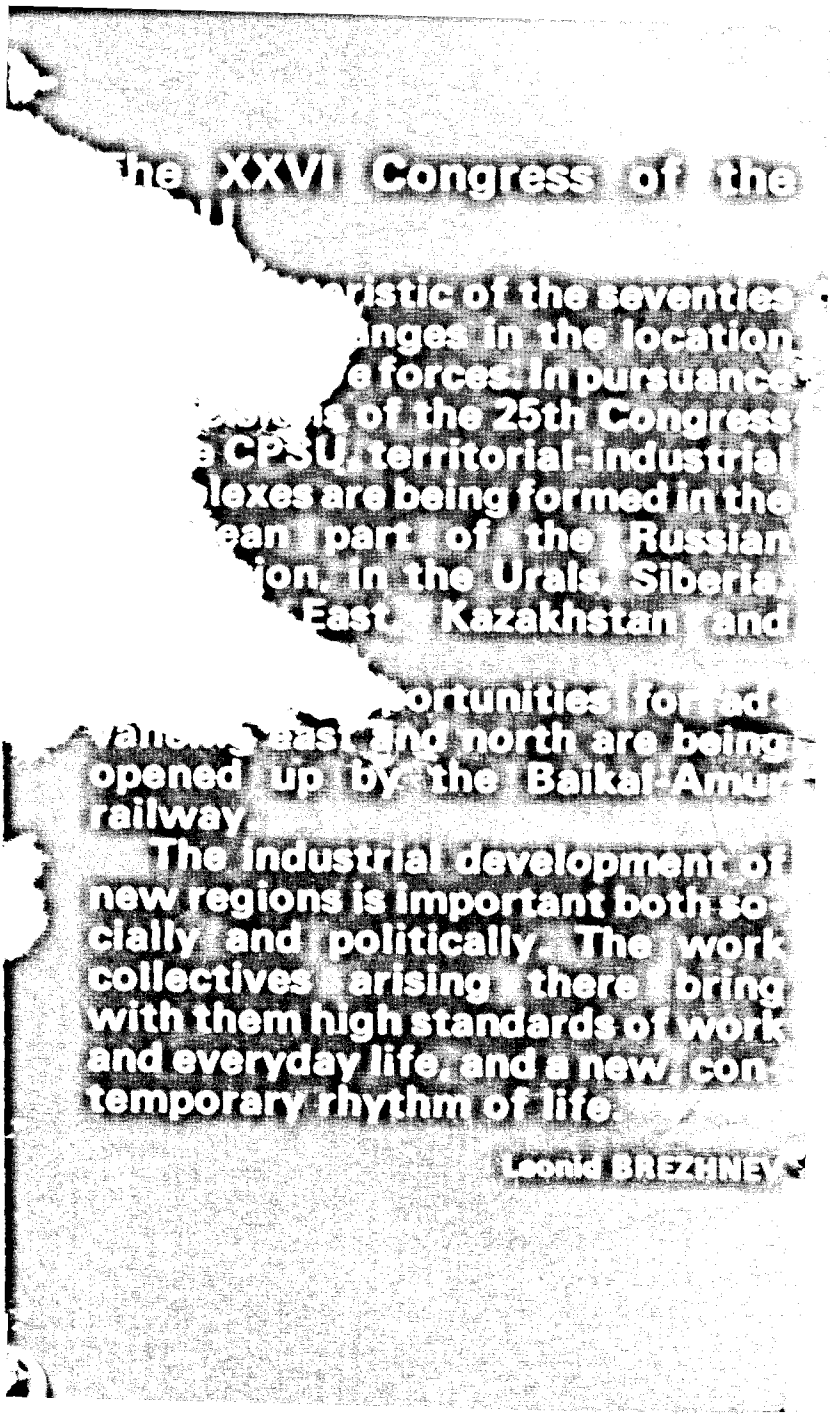
SIBERIA Sets the Pace to Progress

The Soviet Union *TODAY AND TOMORROW*

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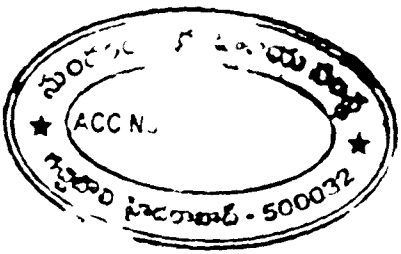
railway.
The industrial development of
new regions is important both so
cially and politically. The work
collectives arising there bring
with them high standards of work
and everyday life, and a new con
temporary rhythm of life.
Leonid BREZHNEV

The Soviet Union

TODAY AND TOMORROW



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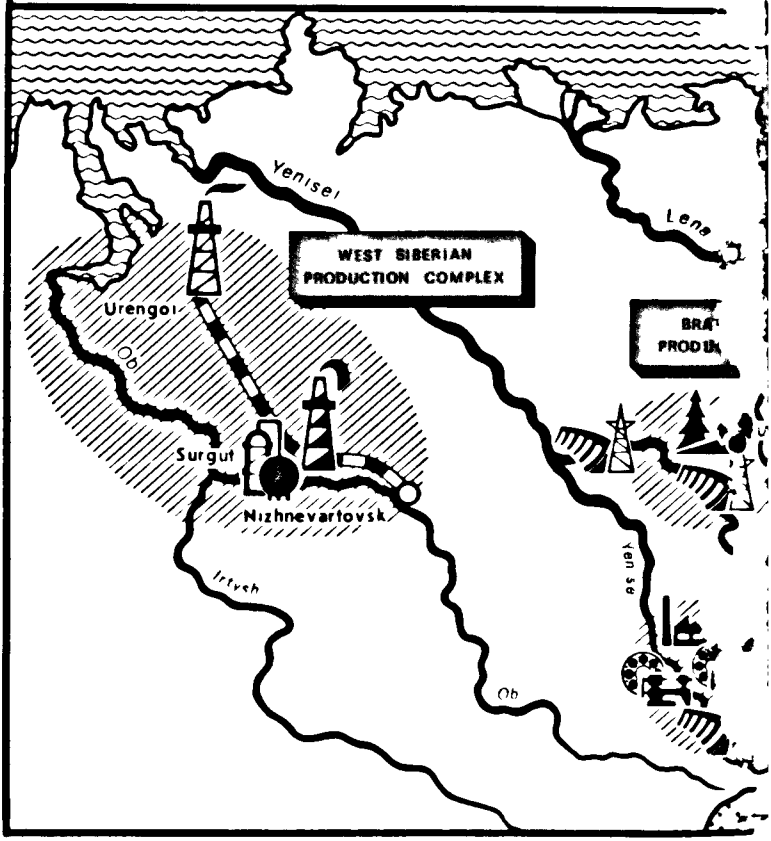

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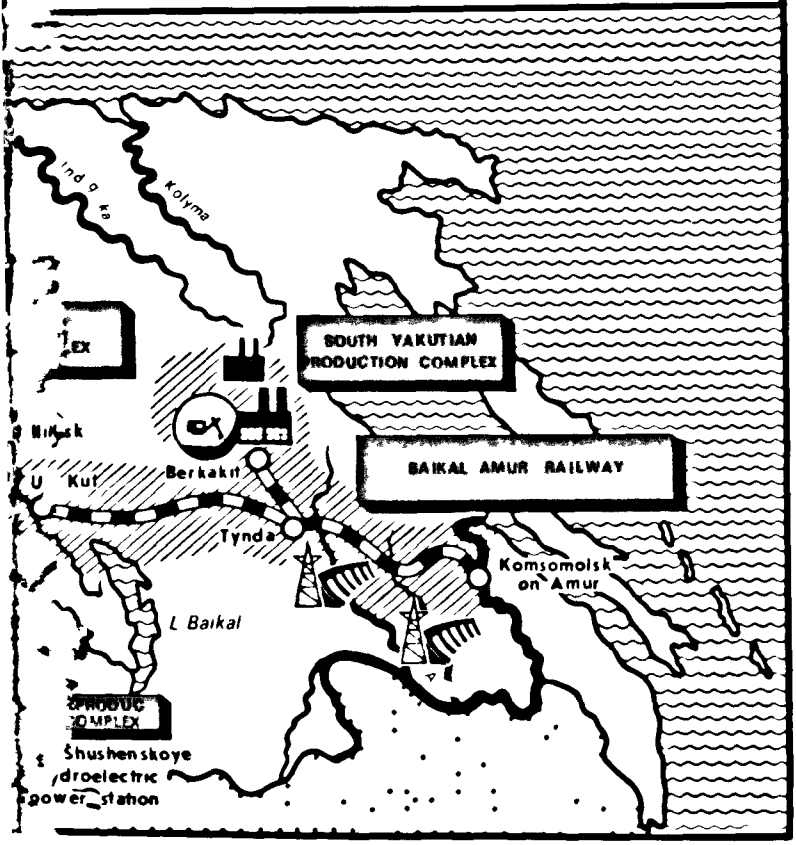
Siberia today is an enormous construction site It is not just a case of new giant plants being put up, but of the creation of whole territorial production complexes the West Siberian, the Baikal Amur (BAM), the Sayan Shushenskoye and others Major industrial amalgamations such as these provide the only



possibility for the efficient industrial development of large regions with difficult climatic and transport conditions

Addressing the 18th Congress of the Komsomol (the Soviet Young Communist League) Leonid Brezhnev dwelt upon the development of Western Siberia He said In the space of only ten years we have turned this area of the *taiga* into the country s main oil base A powerful gas and chemical industry is developing there at the present time Now, the Tyumen Region landscape is characterised not by deer paths running through the forest, but by new towns oil and gas fields, industrial plants, railways and highways And on what a scale! Just think comrades the territory along the Ob being opened up and settled takes in a million square kilometres This is approximately equal to the area of Spain, Italy and Great Britain taken together

Yes, we have boldly allocated immense resources for this development And we have made no mistake The expense has proved to be justified Today, Tyumen produces nearly a half of all Soviet oil, and large quantities of gas

Today Siberia is developing at a faster rate than other areas of the country

Hundreds of new towns have been built here Each serves as the economic centre of a newly developing region There is Divnogorsk on the Yenisei,

for instance with the Krasnoyarsk hydroelectric station the world s biggest Bratsk serves a huge forest products utilisation complex Angarsk is the centre of Siberia s petrochemical industry Norilsk is the country s leading producer of non ferrous metals

Alexander Marshalov Hero of Socialist Labour, is an operator of one of those giant excavators used in major construction works who helped build the Krasnoyarsk hydropower station, and who is now working on the even bigger hydroelectric project the Sayan Shushenskoye station

He was asked by some foreign journalists what the main object was in developing these new regions and opening up Siberia s hidden wealth

To provide a better life "
was Marshalov s reply
' For you, personally? '
the visitors queried
' For everyone in the first place,"
he answered And that includes me '

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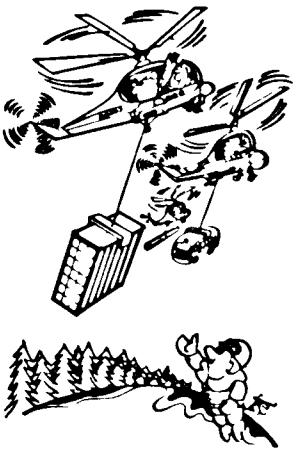
The Siberian dimension



The ancient Greek historian, Herodotus believed that running through Siberia was the border line marking the dreaded unknown the end of the human world the boundary beyond which a living being is condemned to exist in a perpetual state of fear Today boundless Siberia—which covers three times the area of Western Europe—has become a land of almost unlimited promise Its development is one of the biggest undertakings of our century

Here descriptions customarily begin with superlatives Siberia has the longest rivers running through the wildest parts the deepest (and most beautiful) lake Baikal, the greatest volume of capital investment the world s biggest scale of construction And people of the greatest endurance who work in a climate where the temperature ranges from 40 C in the summer to —60 in the winter

Not so long ago Siberia s fame rested on its forests and its grain then Siberian coal and diamonds made their appearance and almost immediately after that all the talk was about Siberia s energy resources

We are already accustomed to such expressions as the Siberian tempo accelerated development and potential the Siberian scale and the Siberian character Formerly Siberia was synonymous only with cold but now it is a standard by which to measure activity a criterion of progress

In the years of Soviet government Siberia s socio economic development has proceeded at practically cosmic speed Compared with the pre revolutionary period (taking the best year 1913) industrial production is 450 times higher

And Siberian statistics continue to capture the imagination This area has more coal than that possessed by all the capitalist countries taken together It contains a large proportion of the country s iron ore

and oil resources four fifths of the USSR s forest resources and the same proportion of its hydroelectric resources The Sayan Shushenskoye hydroelectric power station at present under con struction will be the world s biggest with a capacity of 6 400 megawatts The Bratsk pulp and paper mill is also one of the biggest in the world The Baikal Amur railway is one of the most impressive undertakings of its kind anywhere and with the greatest length of track These superlatives are an inseparable part of present day Siberia of its natural and man made wonders

Siberia is also noted for its firsts For the first time in the practice of gas extraction drilling in all areas is being done using a multiple drilling technique whereby a number of bore holes are drilled in different directions from the one rig For the first time the towers for high tension transmission lines are being pre assembled at con venient locations and then put in place by helicopters

In Siberia where as *Time* magazine put it every day practically sees a new discovery they know the value of the time and money which the Soviet government apportions for the planned develop ment of the natural wealth of this vast region

The areas being opened up are notable for the harshness of their climate They are a long way from the main industrial scientific, educational and cultural centres and have only intermittent transport communication There is a shortage of labour which is expensive and this involves higher outlays

What kind of strategy for the development of the productive forces is the most economic for Siberia today?

This question was examined by the 25th CPSU Congress the relevant documents of which contain the following passage Priority will be given to the development of the eastern regions and especially Siberia where it is planned to raise industrial production by almost 50 per cent In the regions of Siberia and the Far East there will be an accelerated development of energy intensive industries the fuel industry and agriculture and at the same time of the whole complex of the social infrastructure including housing services cultural amenities and urban transport

The opening up of these new regions is a state responsibility based on the state plan for the USSR undertaken to serve the interests of the whole country the whole of Soviet society In the *taiga* and the *tundra* there are no private employers no mono polies concerned only for their profits and caring nothing for the local residents or future generations Instead the owner is the socialist state representing the vital long term interests of all the peoples of the USSR

The promotion of industry to the east of the Urals which form the dividing line separating Europe from Asia has been proceeding in a systematic planned manner And the concentration of the country s forces in this strategic direction is growing from year to year

The first substantial step toward the east was taken by the Soviet Union at the beginning of the thirties with the need to create a second coal and steel centre of the country after the Donbas. The Urals Kuznetsk complex combined the coking coal of the Kuzbas with the iron ore resources of the Urals On the face of it, such a task would seem to be relatively straightforward to develop a fuel base in the Kuzbas to supply coal to the ore mining industry of the Urals and to avoid empty wagons going back, to establish a metallurgical industry in the Kuzbas with the Urals furnishing the raw material But such an undertaking is by no means as simple as this might suggest To carry it out required the comprehensive development of the whole region

Together with the rapid development of the coal industry and establishment of metallurgical plants transport had to be provided which meant laying railways and building highways The first chemical plants were built, based on the chemical conversion of coke Soon there was a large construction industry The steel produced served as the basis for creating Siberia s own engineering industry

The chief engineer of a Chicago firm which helped in the setting up of the complex said they thought it was quite impossible for us to build the 150 ton open hearth furnaces and big blast furnaces and rolling mills that we had in mind After all he pointed out they had only just begun to build such plants in America What could the Russians hope to achieve without experince lacking mechanical equipment, and with unskilled labour? He could never have imagined that Russia would build this metallurgical giant in just twenty three months In creating the Urals Kuznetsk plant complex, Soviet specialists employed ideas which subsequently formed the basis of projects involving new territorial industrial complexes

Some American economists have said that, among the factors which heightened interest in the USA in regional planning the most influential was the success of the Soviet plans, and that the TVA (Tennessee Valley Authority) programme begun in the thirties was a direct response on the part of President Roosevelt to the Soviet Union s first five year plan

The experience of creating the Urals Kuznetsk complex demonstrated the efficiency of this method of developing the economy The process of setting up territorial production complexes in the

eastern regions of the country has been carried out on a particularly wide scale since the war that is over the last thirty years.

Construction of the powerful hydroelectric stations on the Siberian rivers began in the fifties with the Angara Yenisei programme. The mid sixties saw the beginning of the first stage of the West Siberian oil and gas complex. And the mid seventies saw the start of the huge BAM project the Baikal Amur Railway and the associated economic development of the regions along its route.

The setting up of major territorial production complexes constitutes a new stage in principle in the development of the productive forces of the country as a whole and of its eastern regions in particular.

The territorial production complex

Siberia whose economic potential today exerts an appreciable influence on the course of world economic development at the beginning of the 20th century accounted for less than 3 per cent of Russia's industrial production At the present time Siberia's industrial production is considerably greater than the output for the whole of the Soviet Union before the Second World War

The term territorial production complex appeared only about ten years ago although the idea itself of locating and developing the productive forces taking into account all branches of industry and territorial (local) factors was much older originating in the early years of Soviet government

The Urals Kuznetsk plant which as we have already mentioned, was built in the thirties may be regarded as the prototype of this form of undertaking providing for a comprehensive solution of the problems of the distribution of the productive forces It marked the USSR's first step in adopting a far reaching investment programme of such large scale involving many branches of the economy

The planning and building of new complexes represents a continuation of the programme for the systematic development of the natural resources of the country and its huge regions But the scale of this programme has grown immeasurably in keeping with the capacity of the Soviet state to implement it Over the past ten years the Soviet Union has almost doubled its economic capacity The Krasnoyarsk hydroelectric station which was brought up to full generating capacity (6 000 megawatts) in 1970 produces nearly 50 per cent more electricity than did all the country's stations in 1932

Production cannot be distributed evenly over the whole country It is clustered at different places on a large scale in some areas and small in others The large formations are the territorial production complexes and the small—individual industrial centres

The very word complex implies the creation within the limits of a defined territory of a single economic organism such as will ensure the best utilisation of the natural labour and material resources of the area in question The aim of such a complex is not confined simply to the exploitation of what has been provided by nature—oil natural gas or timber The comprehensive approach presupposes the all round development of a region which is planned not as a raw materials or power supplying appendage to more populated or developed areas but as a self sufficient unit which will contain everything necessary for the people of the region to enjoy a high standard of living

The development of regions settled long ago proceeded gradually over centuries Villages grew into towns and cities factories were built transport facilities were established and extended But in new regions everything has to be done at once This has both advantages and disadvantages On the one hand enormous outlays are required But on the other wasteful haphazard growth and dissipation of means can be avoided Rational grouping of enterprises alone can reduce capital investments by 20 30 per cent and production costs by 30 per cent

The territorial production complex is a living cell of the whole organism of the national economy and as such it cannot exist apart but forms part of an overall system of mutual dependence For instance the Baikal Amur Railway is being built by the whole country This rail artery will provide the impetus for the development of several production complexes in adjacent regions with a total area of about one and a half million square kilometres The returns from recently developed regions likewise extend beyond the framework of a single region For instance Siberia s oil and gas go to meet the needs of the entire national economy

An important advantage of the territorial production complex is that there is a common transport network construction base housing industry municipal economy and network of schools and hospitals etc for the whole complex Today s regional complex means that instead of planning a certain number of factories and individual towns the planning is for a whole industrial region and zone of urban settlement

Siberia today may be conceived of as a spatial combination of productive forces And included in the integrated planning of the location of industrial sites city blocks and agricultural areas is the setting aside of forest parklands and other places for recreation In addition reserve areas are set aside for future development No matter how rapid the growth rate it must not catch

the town planners unawares It is impermissible to allow scientific and technological progress even that considered most essential to become the cause of population congestion and air pollution with smoke and fumes discharged by factories and plants and to be confronted by the dismal sight of rivers poisoned by industrial effluent

The solving of the problems normally encountered in opening up new regions is characterised by a differentiated approach depending on the concrete conditions in each case Take the problem of accommodation for example On some construction sites the trailer, or movable hut system is used On the BAM project it was decided at the outset to build settlements along the track provided with proper amenities For manning the Tyumen oil fields a kind of shuttle method is employed workers living in the towns of Surgut and Nizhnevartovsk are flown to their locations by helicopter up to a distance of 200 km

The territorial production complex as we have stressed presup poses the harmonious development of an entire region—not only its economy but also the social aspects cultural facilities and everyday conditions of life for the people living in it in a word everything necessary for a settled existence in a place that one can call home

In accordance with the Eleventh Five Year Plan (1981 1985) for the development of the USSR national economy the following territorial production complexes are taking shape

West Siberian—beyond the Urals in the river basin formed by the Ob and the Irtysh (petroleum products)

Sayan (Eastern Siberia in the upper reaches of the Yenisei)

Bratsk Ust Ilim (Eastern Siberia in the upper reaches of the Angara)

South Yakutian (to the east of Lake Baikal)

Pavlodar Ekibastuz (Kazakhstan in the upper reaches of the Irtysh)

Mangyshlak (the peninsula on the eastern shores of the Caspian Sea),

Karatau Dzhambul (in southern Kazakhstan)

South Tajik (in the foothills of the Pamirs)

Timan Pechorsk (in the north west of the European part of the USSR in the Pechora river basin),

Kursk (centre of the European part of the USSR) a production complex based on the mineral resources of the Kursk Magnetic Anomaly

These are important economic regions for the Soviet economy and most of them lie in Siberia

Siberia's oil: how long will it last?

The Baku oil fields, the oldest in the USSR, took a hundred years to reach an extraction rate of 20 million tons a year In Tataria, oil extraction attained a level of 100 million tons a year in fifteen years The Tyumen fields in Siberia topped the 100 million mark after just four years

Siberia has a concentration of deposits of mineral fuel—oil natural gas and coal If required the Tyumen region alone could yield 1 000 000 million cubic metres of natural gas But such a volume is not needed by the Soviet Union at the present stage For the time being the extraction of gas from the Tyumen area is being increased at the rate of 25 000 million cubic metres a year In the future as new deposits are opened up, the quantity of gas extracted will be increased

In the case of coal the Kansk Achinsk coal basin is capable of yielding 1 000 million tons a year Work is proceeding today on the first of the strip mines the Berezovsk on the basis of which a thermal power station is being built with a capacity of 6 400 megawatts Ultimately it is expected that up to ten such power stations will be built

The picture is much the same with oil It is reported that the American CIA expects USSR oil extraction to level out in the early eighties and even begin to decline especially in Western Siberia This news was seized upon in the West but it does not correspond to the reality The prospects held out by the deposits in Western Siberia are such that no levelling off of the rate of extraction here is envisaged Naturally sooner or later the volume of oil from this region will settle down to a steady flow as is now the case with the deposits in the Volga area But those who are predicting a falling off of the Western Siberia extraction rate will simply not live long enough to see this day

Siberia s oil resources have still not been fully explored Only limited prospecting has been carried out to the north of the Tyumen region where according to predictions already confirmed in part oil is also to be found

In the Tomsk region a big flow of oil was tapped recently from palaeozoic strata This could be significant Western Siberia s oil comes from mesozoic deposits and it was generally thought unlikely that oil would lie at deeper levels But now oil is being recovered in commercial quantities from older geological strata found over much of the territory of Western Siberia and lying moreover not at a depth of 5 000 to 7 000 metres but at approximately 3 000 metres

In Eastern Siberia oil is not so far being extracted on an industrial scale but this area is expected to contain considerable resources

Siberian Conditions

Having become the main fuel base of the country Western Siberia delivers black gold not only to plants in the Urals and in the European part of the USSR but even to such traditional oil extracting regions as Baku and Grozny Tataria and Bashkiria And Tyumen oil is also pumped by the transcontinental Friendship pipeline to the fraternal socialist countries

It should not be thought however that Siberian oil flows like a river and that it can be had just for the taking Before wells can be drilled in the swampland it is first necessary to build up artificial islands And to get to new deposits in this region involves forcing a way through practically virgin terrain

Take for example the complicated matter of building a road through the Siberian swamps This is done in winter with the help of powerful bulldozers which carve a way through the hard ice cover to a depth of 1 1 5 metres The wide trenches thus formed are then filled with snow which is rolled and compressed as if it were asphalt and water is added making a solid continuous block of ice And so that this ice roadway will not melt away in the spring it is capped with a layer of spoil pine needles wood chips or moss—anything at hand

The result is a functional road that serves its purpose even in the warm part of the year This is another Siberian paradox in areas where the ground is permanently frozen special efforts have to be made to overcome the difficulties this causes and in places where it is not frozen it has to be made so artificially!

Roads through swampland are also constructed with a surface formed of logs and branches This gradually gets swallowed up by the quagmire whereupon more wood has to be cut to build up the surface again So the battle goes on throughout the summer the swamp being like a bottomless pit

But these roads are still not sufficient Tens of thousands of tons of supplies and equipment of all kinds are brought in from hundreds

of kilometres away by plane and helicopter thus adding considerably to the cost Taken as a whole the cost of developing Western Siberia s oil fields and gas wells is triple the average for the country These and several other difficulties are for the time being still preventing the development of Siberia at the pace and on the scale desired by the state

Addressing the 18th Congress of the Komsomol Leonid Brezhnev said It is from the Tyumen region that we plan to receive in the next ten years the main growth in the output of oil and gas and valuable chemical raw materials derived from them In this connec tion there is beginning—more correctly has already begun—a new, more complex stage in the development of Western Siberia The task before us is to double or even treble the volume of operations there This will demand both new material and technological outlays and more manpower

What are the special features of this next stage in the planning of production complexes for Western Siberia? What are the new tasks confronting those who are pioneering the exploitation of the riches stored in the ground in this region?

The first deposits opened up in the southern regions which have accounted for the main growth of oil output are producing at their planned capacity Now it is the turn of the smaller deposits in the northern regions where access is difficult and which are far from transport links and industrial centres The development of these deposits has already begun

The opening up of the gas deposits in the northern Tyumen region is also a difficult undertaking The main reserves of natural gas are concentrated in the permafrost zone Here only a slight upset to the temperature pattern balance arrived at by nature after centuries is enough to make the ground begin literally to melt away under your feet Soviet scientists builders and workers on the projects have succeeded in solving a number of difficult scientific and tech nological problems not encountered before in world practice connected with the tapping and transportation of gas under these exceptional conditions

Besides the oil and gas workers builders too are playing their part in developing the northern deposits Here loads can be delivered by truck only in winter (by roads formed on the frozen ground) or by air This involves new technical and other decisions in planning For instance wide use is made of the integrated block method of construction Tyumen plants fabricate block packages which contain all necessary technological equipment fittings appliances and equipment Each such block represents a unit of the future

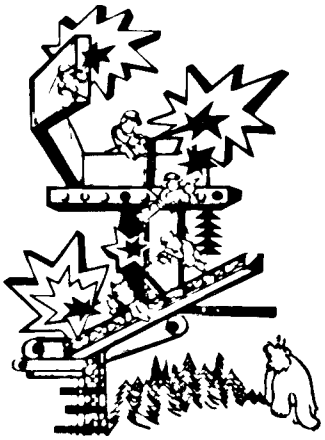
construction—compact and convenient for delivery by any means of transport On arrival at the site these blocks are installed in the places already prepared for them and are then simply joined together

Oil and gas—these constitute the foundation of the West Siberian complex At the same time of course the foundation represents only the beginning of any structure The new phase presupposes the creation of a petrochemical industry based on the local resources Huge plants are to be built employing advanced technology and the latest equipment

On the banks of the Irtysh on the outskirts of the old Siberian town of Tobolsk the framework of a petrochemical complex is already going up Another petrochemical giant is rising in the neighbouring Tomsk region It will produce a whole range of products polyethylene polypropylene methanol benzol divinyl

Meanwhile development of Western Siberia s oil and gas fields continues The production of oil and gas in West Siberia and their transportation to the European part of the country have to be made most important elements of the energy programme in the Eleventh Five Year Plan and also in the Twelfth stressed Leonid Brezhnev at the 26th CPSU Congress

The Angara industrial grouping



The Baikal Amur railway, the Savan Shushenskoye hydro power station, the Bratsk Ust Ilim production com plex these and some other construction projects of the Tenth Five Year Plan have no equal in the world as regards their scale, boldness of con ception, and advanced tech nology Only a socialist society is able to carry out such large scale projects for the transformation of an entire geographical region

To obtain a hotel room in Bratsk is no easy matter All the year round there is a constant stream of overseas visitors—more than 12 000 from heads of state to ordinary tourists—to the shores of the Bratsk reservoir There are twenty excursions a day to the Bratsk power station where the visitors observe how five persons control one of the world s largest hydropower stations More often than not the guests are Americans West Germans and Japanese many of whom have their photographs taken against the background of the mighty dam They also want to see the aluminium plant, and the world s biggest timber and pulp and paper complex The prominent American statesman Averell Harriman, who flew over specially for the damming of the Angara in 1959 wrote that anyone who had visited the Soviet Union but had not seen Bratsk must be considered to have a gap in his knowledge of the world

The visitors want to know in particular whether the climate here is really as severe as say in Alaska and to see whether the *taiga* is indeed as wild as the Amazon jungles And they are convinced that the conditions created here by nature are even more rigorous than in Alaska and more difficult than along the Amazon However the conditions created by people for living here are closer to those of Europe An American I met in the Hotel Taiga said I m even rather disappointed—there s too much order just like in London

Nevertheless the tourists busily photograph the blackened tower

of the Bratsk fortress built by Cossacks three hundred years ago The guide points out that it is more than an historical monument for at this age it also serves as the best possible advertisement for the Angara pine

Taking leave of the Angara many visitors copy out the recipe for Siberian fish soup which they had taken a fancy to It goes like this take a bucket of water and add a quantity of the small fish ruff some bay leaves and pepper and bring to the boil over a camp fire Simmer until the ruff are tender Strain and discard the fish Then into the clear bouillon put real fish grayling or salmon trout When the eyes of the fish have turned white pour into the bucket half a tumbler of vodka to give it the right smell as the local fishermen say and in a few minutes the soup is ready to serve

But the old hands here say that such soup must be made over a camp fire on the banks of the Angara, where the air has a special quality and the water is crystal clear

Incidentally the Angara water is an essential ingredient not only for the soup It is also of great importance for the production of bleached pulp and of specially valuable cord used in the manufac ture of automobile and aircraft tyres

The water and the forest are the real treasures of these areas It has been calculated that for every inhabitant on the earth there is an average of one and a half hectares of forest In the Soviet Union as a whole it is five hectares and for each Siberian there are 45 hectares of magnificent forest

But as a corollary to this Siberia has a shortage of people This circumstance demands the construction of automated plants em-ploying the latest technology for opening up the wealth of Eastern Siberia

'There can be no doubt that in the future the Angara and the whole of the surrounding region will take its rightful place in the development of Siberia reads part of the GOELRO plan approved by Lenin in 1920 dealing with the future development of power generation in this region The plan laid the basis for the Soviet Union s industrial progress For many years the ambitious plans envisaged could not be realised first because of the Civil War and foreign intervention and then because of the Second World War But now the position has changed and the plans are rapidly being put into effect

Herodotus was convinced that Siberia marked the end of the human world And much later as recently as the 19th century Dostoevsky called it a lifeless place But today the huge expanse of

Siberia equal in area to the whole territory of the United States or to the Australian continent has become a land of great promise

Siberia s territorial production complexes are united by a community of power and natural resources and well arranged transport communications which provide for the most economical large scale movement of goods It has been demonstrated that a given combination of industries towns and transport communications possesses an interesting feature in the case of unplanned groupings there is a lowering of economic efficiency but with a unification of interconnected elements there accrues an immense additional gain—the complex effect, as the economists call it

These complexes like planetary systems around a sun form an orbit, so to speak around their individual power centres—the giant capacity hydro stations such as the Bratsk Ust Ilim Krasnoyarsk and Sayan Shushenskoye

One of these complexes the Bratsk Ust Ilim situated in the Angara valley will unite industries covering an area exceeding the territories of Denmark and Holland taken together Among the enterprises of this territorial production complex is the Ust Ilim timber processing complex which includes a pulp plant being built with the participation of the CMEA member countries

This complex will rank in future as one of the most important in the USSR economy Such a prospect is determined by the fact that it has the cheapest electricity in the country from the Bratsk and Ust Ilim hydropower stations combined with a concentration of first class forest water and mineral resources and a favourable location as regards transport being close to two main trunk railways—the existing Trans Siberian line and the new BAM line now under construction

The first step towards creating the complex was taken in the middle of the fifties with the commencement of the building of the Bratsk hydroelectric station Construction of the next power station in the Angara series—the Ust Ilim—began in 1965 and by 1977 fifteen generators of this station were producing at capacity It is interesting to note that the cost of building the Ust Ilim station was less than in the case of Bratsk The experience acquired by the Angara construction teams made itself felt, as did the help of the Bratsk industrial complex Incidentally the first street (now the main street) in Ust Ilimsk, was given the name Bratsk

The temporary hardships endured by the firstcomers to Siberia are being quickly overcome with the close attention being paid to living

conditions This is one more advantage of the comprehensive approach to regional development a characteristic of which is the priority accorded to the provision of housing and social amenities etc

From the Bratsk power station which feeds electricity into the single grid covering Siberia twenty transmission lines spread out, carrying power to the Bratsk aluminium plant, the timber and pulp and paper complex the heating equipment plant and the Korshunov ore dressing plant which produces 15 million tons of ore a year

The Ust Ilim station will serve as the power base for a new timber utilisation complex for the mechanical and chemical processing of wood products Over an area of hundreds of thousands of hectares ten timber industry enterprises are being organised that will supply 7 4 million cubic metres of timber a year Provision has been made for the preservation and restoration of the Siberian forest The rule is that timber felled must be replaced According to plan in 80 100 years time the loggers will be able to return to the area felled in the nineteen seventies to find new stands of timber ready for exploitation

All chemical processes at the complex will be computer controlled which will significantly reduce the number of people working in occupations hazardous to health Environmental protec tion measures provided for include a closed cycle water circulation system a system for eliminating harmful gases and special reaffore station measures

The main component of the complex will be the pulp and paper plant all 63 sections of which will for the first time in world practice be housed under one roof The plant is being built as a joint effort by the CMEA countries The contribution of each member country is agreed in advance and is based on the principle of mutual advantage and the national interest of the participants and on the overall benefit to the socialist community as a whole An important factor in this of course is the need for pulp and paper in the interested countries

The Soviet Union undertook the designing of the plant, and its construction and operation About 40 per cent of the cost of construction is being covered by Bulgaria, Hungary the GDR Poland and Romania by way of deliveries of machinery equipment and materials The first concrete for the foundations of the new plant was poured in March 1975 and in 1979 the first section of the enterprise began producing pulp The agreement provides that the countries participating in the project will receive Ust Ilimsk pulp in proportion to their contribution The design capacity of the complex is for half a million tons of sulphate pulp a year Such a quantity is

enough to produce high quality grades of paper sufficient for about 3 000 million books

Not far from Ust Ilimsk major reserves of iron ore were discovered giving rise to the Korshunov ore dressing plant that we have already mentioned Zheleznogorsk Ilimsky is the name of the new town which is rising close to the mine workings

It would be a daunting task to list all the enterprises that have been are being and that will be built around the mighty Angara power stations And they are all characterised by their huge size corresponding to the scale of Siberia (for instance the Bratsk factory to manufacture heating equipment will produce 70 per cent of all the steel radiators made in the USSR), by their advanced technology and by their strict observance of environmental protection measures

Siberia—a Land of Young People

In the USSR as a whole young people up to the age of thirty account for about a third of the work force but in Siberia they make up a half The opening up of this promising region with its great energy resources and rich mineral deposits requires strong hands—the hands of youth And the young people in turn look to Siberia where the rigours of the country and the necessity to start everything from the very beginning fully answers the striving of young men and women to prove their strength of character and their determination to show their worth in work that is often of heroic dimension

To young Siberians—both native born and newcomers—the doubts and frustrations associated with youth are practically unknown The difficulties encountered here are so much greater and time rushes by more quickly as does the period of a person s growing up Siberia can be counted on to quickly develop in the youth civic maturity and a high level of professional competence

An illustration of this is the participation of young Siberians in the work of government in the Soviets (Councils) of People s Deputies In the Ust Ilimsk Soviet the governing body of the city which is growing up at the same time as the building of the power stations on the Angara and construction of the giant timber utilisation complex 40 per cent of the deputies are under the age of thirty Seven years ago when Ust Ilimsk received city status those in this age group accounted for 30 per cent of the deputies Their growing influence is therefore evident

Viktor Mikhailov a foreman builder and representative of the older generation in Ust Ilimsk was elected to the Supreme Soviet of the Russian Federation—the largest of the fifteen Soviet republics

making up the USSR Well thought of by everyone Mikhailov who is an old time resident knows the problems of the city and how to deal with them But can this be said of the young deputies lacking experience in public administration? Doesn t their role boil down to being a purely representative one with the decision making resting with the older deputies possessing greater authority?

Judge for yourself they said to me in the city Komsomol headquarters 'Take Tatiana Ulyanova a construction worker who is a deputy at the age of 25 She has a wide understanding of the problems that arise and her approach to them is statesmanlike And in a young town of 50 000 inhabitants the problems are not few For instance there is the scissors problem as between industrial construction and the building of civic projects The management of an enterprise might say First priority is to put the plant into operation then we can attend to the rest But this rest comprises housing kindergartens dining rooms and cafes a cultural centre and a stadium—everything that is needed for the normal life of a town and its young inhabitants There can hardly be a high rate of labour productivity from people if they do not have a flat and if there is no crèche for the baby And it s unlikely that workers will have much success with extramural studies if they re housed in noisy hostels and don t have reasonable conditions for study and rest

Six months ago Tatiana Ulyanova levelled criticism against those managements which were being tardy in attending to these matters of vital concern to the young people And this brought results Everyday living conditions were much improved and hous ing construction was accelerated

In the programme of work drawn up in 1920 to supply the whole of the country with electric power the territory of Russia was divided into eight regions and in the case of Siberia it was stated that the plan applied only to the western part Even for the experts who drew up the plan (which many in the Western world derided) it was difficult at that time to relate the prospects of Eastern Siberia to the development of the national economy of the country as a whole

But above the words saying that the plan applied only to the western part of Siberia Lenin wrote in pencil *for the time being* And now the time has come to include the eastern part

Siberia is rightfully called without any exaggeration a land of the future The Bratsk hydropower station the Abakan Taishet railway the Krasnoyarsk Bratsk and Irkutsk aluminium plants the Angarsk and Omsk oil refineries—all of these were built by young people Nearly fifty more major Siberian construction projects will be built under the sponsorship of the Komsomol

Every year thousands of young people go to Siberia to work and pit their strength against the untamed Siberian expanses to make their mark not only by the creation of new industries but also in the form of new towns and cultural centres so that the very notion of Siberia as a remote uninhabited backwoods will be relegated to the history books

Siberia exports ideas

In the summer of 1976, Bratsk was visited by a delegation of members of the International Institute for Applied Systems Analysis (IIASA), set up in Vienna on the initiative of the USSR and the USA The delegation, which included prominent specialists and economists acquainted itself with the ideas, aims and underlying strategy of the USSR s territorial production complexes

Siberia is the most dynamically developing region of our planet says a leading Soviet economist Academician Abel Aganbegyan It is not surprising that it has attracted the attention of the experts of the International Institute In a brief space of time a very powerful energy base has been created here On this foundation the development is continuing of several territorial production complexes for the output of non ferrous metals mechanical engineering plant and equipment, and timber products with a high processing content The first among these is the Bratsk Ust Ilim complex

The director of the International Institute for Applied Systems Analysis Roger Levien said that the idea underlying this complex and the experience in creating it were of international interest A special conference convened by the Institute in Vienna in March 1976 had studied the reports of Soviet specialists on the work being carried out in Siberia he said and the present visit to the Angara by twenty members of the Institute represented the second stage of the IIASA s investigation

The opinions of some of the scientists of the Institute are set out below

David Fisher a professor of Waterloo University (Canada) said that what impressed particularly about the large scale programme for the development of the northern regions was that alongside the giant industrial enterprises, a developed social infrastructure was being created with housing roads, cultural institutions and everyday

amenities Such a policy meant that modern standards of comfort applied and that the long term welfare of the people was assured

For the last couple of years said the Professor he had been studying the development of oil regions in the Canadian north where he had observed a quite different picture Here the sole aim was commercial exploitation for maximum profit and subsequent aban donment of the land leaving behind only unhealed scars It would not occur to anyone in Canada to build such well appointed towns as Bratsk or Ust Ilimsk in the new territories he said

As a scientist, Professor Fisher concluded he would give preference to the Soviet approach to the opening up of new regions

Dr Saburo Ikeda of Kyoto University Japan

Siberia and Japan are neighbours This is not only a matter of geography but also an expression of our growing economic co operation I have seen for myself that in the development of the eastern regions of the Soviet Union an effective programme for the protection of the environment is being carried out A comparison of our two countries in this respect does not favour Japan For a long time I have been concerned with the problem of cleaning up Lake Biwa which is the biggest lake in my country In its geological origin it is the same as Baikal The Soviet Government s campaign for protecting the world s biggest reservoir of fresh water (ten per cent of the total resources) is being successfully implemented A nature protection national park of 30 000 square kilometres (equal to the territory of Belgium) has been established around Baikal The construction of new plants here is banned and existing ones are equipped with the most up to date purifying installations

Siberia exports coal timber and non ferrous metals to Japan It is my opinion that another worthy export item could be the experience of the Siberians in the field of nature protection

Detlof von Winterfeldt (West Germany) specialist in the field of economic modelling

A territorial production complex such as the Bratsk Ust Ilim project could not be built in West Germany Only state planning could ensure the success of such a large scale programme Comparing the TVA programme carried out by the USA with this Siberian complex the American effort solved only regional problems whereas the Soviet example is tailored to the needs of the whole country

For me the most interesting thing has been to see this purposeful planning at first hand Provision is made for so many square metres of living space per person a specified number of doctors for the given population and so on in order to realise the main aim satisfaction of

the material and cultural needs of the people For most of us who work in the scientific field the most interesting aspect is not so much the individual achievements as the methodology In this sense it is obvious that the solutions arrived at in Siberia are not only effective for the particular project in hand but have a much wider significance

Professor Wesley Foel (University of Wisconsin USA) said that in pioneering the American Wild West and rapidly developing the economy there Americans had over the course of one and a half centuries forgotten about environmental protection In contrast to this the industrial development of Siberia included planned comprehensive nature protection measures from the outset The members of the delegation had seen for themselves the impressive purifying installations provided for the wood processing complexes and the Bratsk aluminium plant

Speaking on behalf of the IIASA group of ecologists the Professor said they had noted that in the Soviet Union and in Siberia in particular environmental protection was being taken seriously Allocations for this purpose in the Tenth Five Year Plan he had been told amounted to 11 000 million roubles US expenditure envisaged for combatting environmental pollution was of the order of 10 000 million roubles (in dollar equivalent) annually a sum equal to one per cent of the gross national product Such huge amounts approved by the American government are due to the extreme neglect of this problem in the past In the Soviet Union planned allocations were directed at preventing damage to the environment the Professor concluded

• • •

The Soviet people continuing to develop the Angara basin are meanwhile faced with the task of achieving a further rise in production efficiency and of continuing to improve the management of the complex

As in any big and complicated undertaking here too there are problems omissions and difficulties For instance though the structure of the complex has been carefully worked out the parts which make up the whole are developing unevenly as Leonid Brezhnev noted on his recent visit to Siberia There is a lag in the supply of raw material for the pulp and paper enterprises Also the rapid development of the region demands a speeding up in the provision of transport facilities and this applies in particular to the laying of a second track between Taishet and the River Lena This work is proceeding but not at a satisfactory pace

There is no secret about these shortcomings of course On the contrary they are well aired at meetings of Party and Government leaders with the people and in letters published in the national and local press The Soviet people see this as a reliable way of ensuring that the difficulties will be overcome

Star of the first magnitude

At the end of 1978 a new star of the first magnitude in the firmament of electric energy was born on the Yenisei—the Sayan Shushenskoye Hydroelectric Station

Greenwich and Pulkovo are two meridians known primarily for their important astronomical observatories (one in London the other near Leningrad) The Yenisei marks another meridian of different, by no means lesser importance in terms of its scientific and economic achievements

The Yenisei River the biggest in the Soviet Union according to the volume of its flow is one of the greatest in the world Its more than 4 000 km length running from south to north cuts Siberia in two as it were The Yenisei basin covers an area of 2 700 000 square km—nearly equal to the territory of India The geologists have not yet had time to assess the full wealth of this richly endowed region but foreign journalists already refer to it as the Siberian Eldorado For the Soviet leadership scientists and economists it represents a new concept in comprehensive industrial regional development And for the business circles of many foreign countries it represents an arena for international co operation on a large scale

Greatest Hydropower Potential

For a long time the Yenisei flowed practically beyond history as the French scientist Elisée Reclus put it But today the Yenisei together with its tributaries (with the Angara in first place) has the distinction of having the greatest hydropower potential of any river in the world

The first power station built here the Krasnoyarsk has been pro ducing for several years already At the moment it is the world s

largest but soon it will have to yield pride of place to the Sayan Shushenskoye Station (6 4 million kw)

When the USSR announced its intention of building these large capacity power stations some Western newspapers at once accused the Soviet leadership of being obsessed with sheer size and asked who would need stations like this in such a remote uninhabited area

The answer is being provided now The Sayan Shushenskoye power station is the fifth in the Angara Yenisei chain of stations and yet still more energy will be required Sayan electricity is needed for power consuming industries such as aluminium and chemical plants for the production of high quality steels and alloys and for plants turning out phosphorite and asbestos products—all industries forming part of the Sayan territorial production complex Its domain covers an area of about 140 000 square km and includes the Khakass Autonomous Region the city of Minusinsk and seven southern districts of Krasnoyarsk Territory On this area more than a hundred industrial projects will be built The Sayan Shushenskoye power station—the energy base the Abakan railway wagon works the Sayanogorsk Aluminium Plant and a number of electrical engineer ing enterprises in the vicinity of Minusinsk will form the nucleus of the complex

Parallel with the building of the factories and plants power stations and transport arteries construction work is proceeding on housing blocks schools theatres shops and stadiums etc To put up housing here costs 25 30 per cent more than in Leningrad for example And the cost of building hard surfaced roads is five times the average for the European part of the country To bring one worker to these regions of Siberia and provide him with everything necessary for normal work study and leisure etc costs the state approximately 30 000 roubles a sum very much greater than the equivalent for developed regions But the money for all this is found nevertheless

The New Life of Khakassia

A traveller explorer of the last century wrote about Khakassia In this region to the question Where s the treasure? the answer can be given by anyone by simply stamping on the ground and saying Right here! And if you dig in the place indicated you won t be disappointed

Leading museums will not turn down one of the renowned Khakass bronzes (axes daggers and ornaments) The powerful Khakass state in the basin of the Yenisei and its tributary the Abakan was known far beyond the limits of Eastern Siberia ih the VI IX

centuries And in the steppe you can still see the traces of ancient irrigation canals

The wealth of Khakassia lies not only in its ores and coal and timber and water resources Incidentally, when the first road was built in Khakassia it turned out to be cheaper and quicker to pave it with the local marble than start out upon the production of concrete The first block laid in the foundation of the dam across the Yenisei was also of marble We might also add that Khakassia has a beneficial climate (it has nearly as much sunshine as the Crimea) and rich black earth that will grow just about anything—even water melons The favourable combination of all these circumstances provides excellent prospects for the extensive development of the Khakassia region

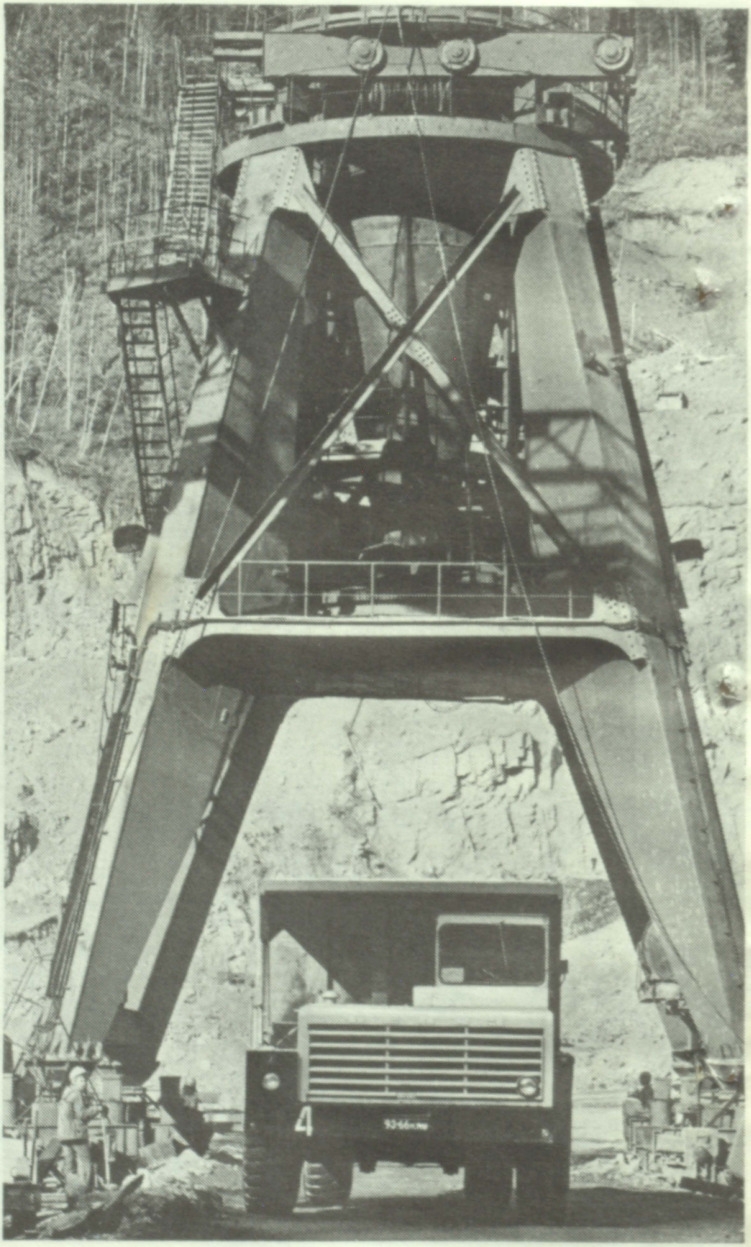
A Soviet captain Bronislav Mainagashev mentioned an incident that occurred once in a foreign port When his ship had docked local reporters came on board Obviously struck by his noticeably eastern appearance they asked him what his nationality was and where he hailed from

He answered that he was a Khakass a representative of the small nationality that lives in southern Siberia The following day the reporters tackled him again, saying they had consulted the Brockhaus encyclopaedia but had found no reference to any Khakass people They were right, for that encyclopaedia was published in pre revolutionary Russia and indeed gave no inform ation about the Khakass

Before the Revolution there were no towns at all in this region Now two thirds of the population of the Autonomous Region live in towns And the latest production put on by the Khakass national theatre was Bernard Shaw s Caesar and Cleopatra , in the Khakass language and produced by a Khakass director

From time immemorial the Khakass people like the other Turkic speaking peoples of Siberia have marked their celebrations and weddings with competitions to see who is the strongest the fastest, and the most dextrous This tradition still strong today provides a good basis for the development of horse racing weight lifting and various forms of wrestling A Khakass youth Ivan Yarigin was twice Olympic wrestling champion

> Siberia land of youth Much has already been accomplished by the first hardy souls, but big new projects lie ahead where new arrivals can prove themselves, test their determination and show their worth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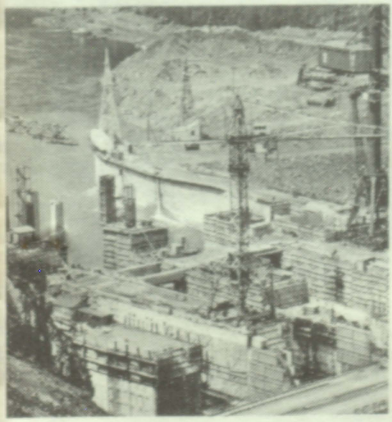
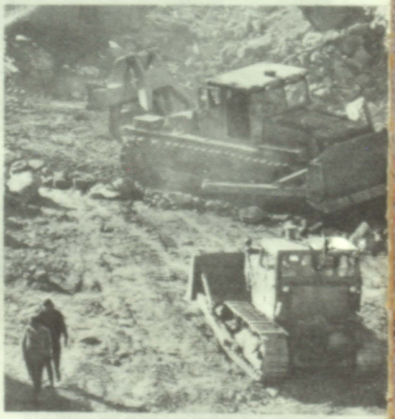
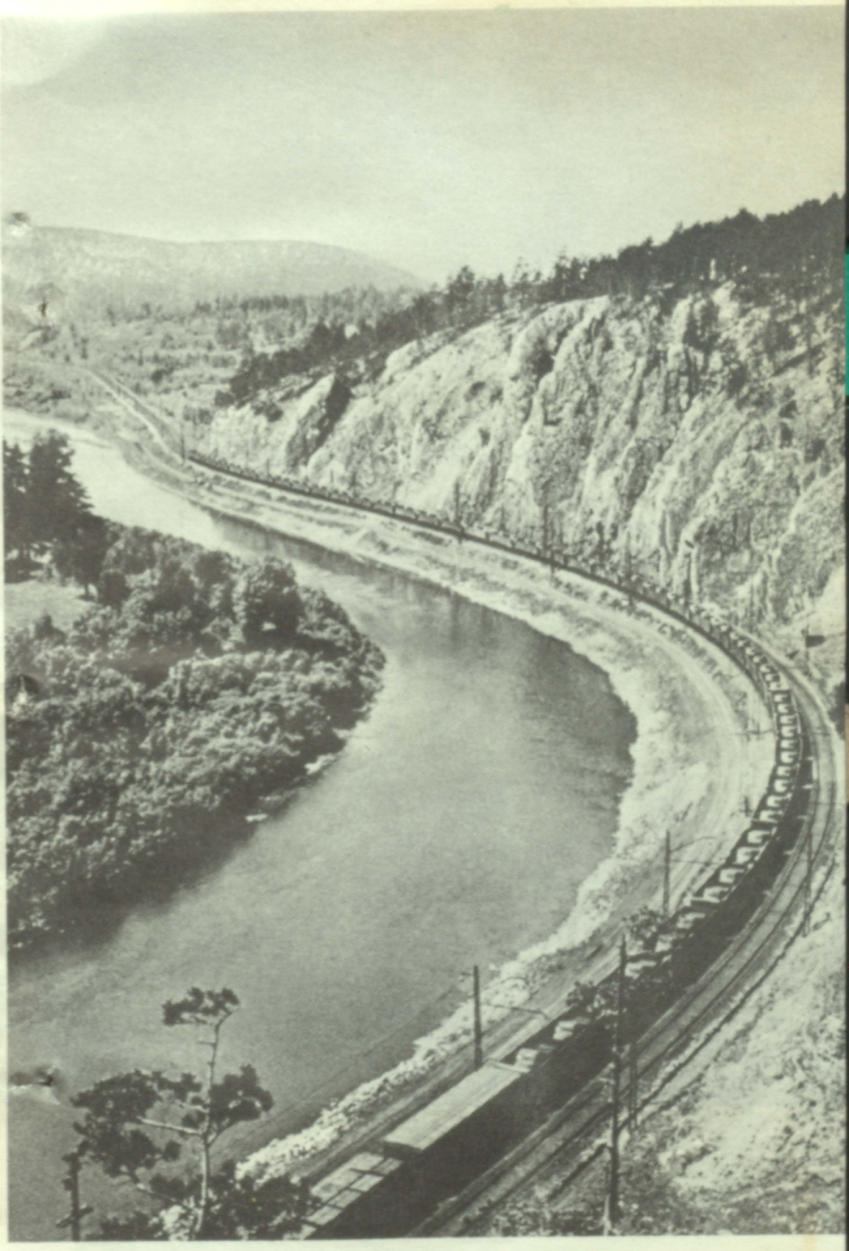


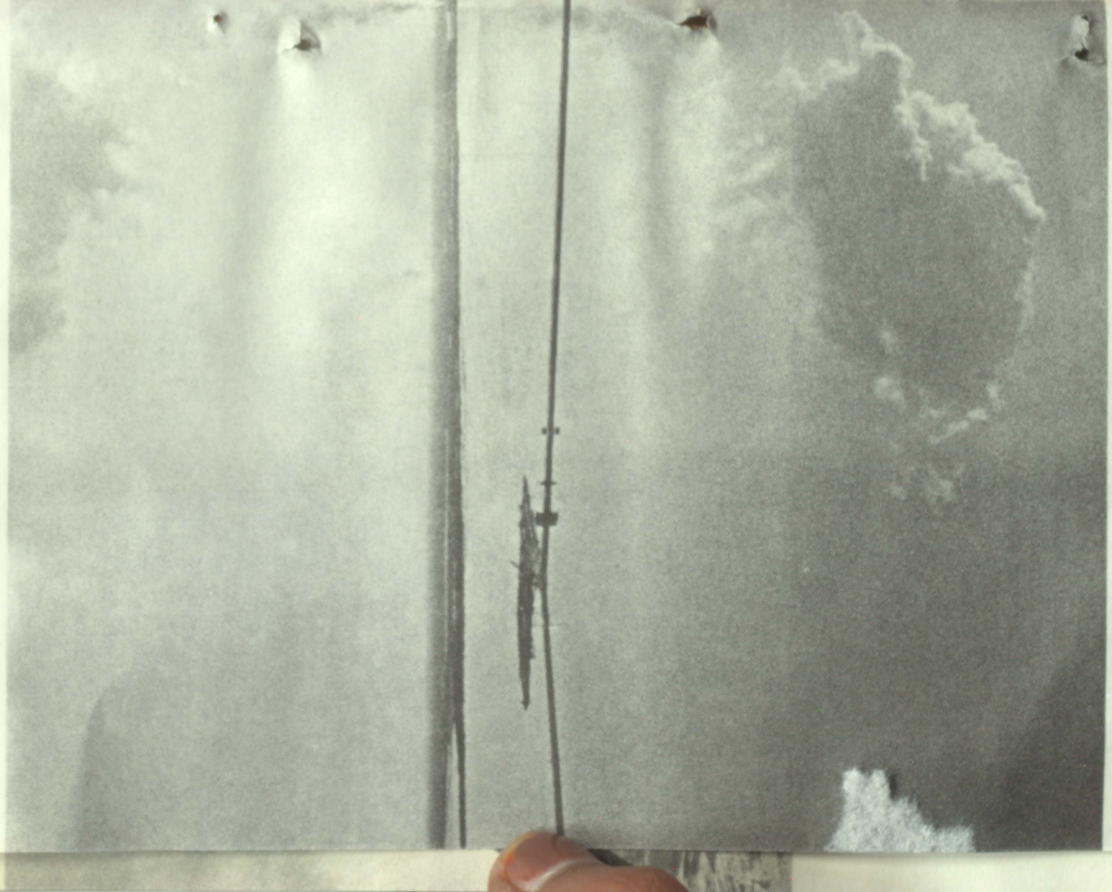
The 6.4 million-kw Sayan-Shushenskoye hydropower station, the world's biggest, is under construction on the River Yenisei.

Replacing the tents and huts of the first-comers, modern towns are springing up. And all aspects of life—work, the daily round, recreation—bear the Siberian stamp.



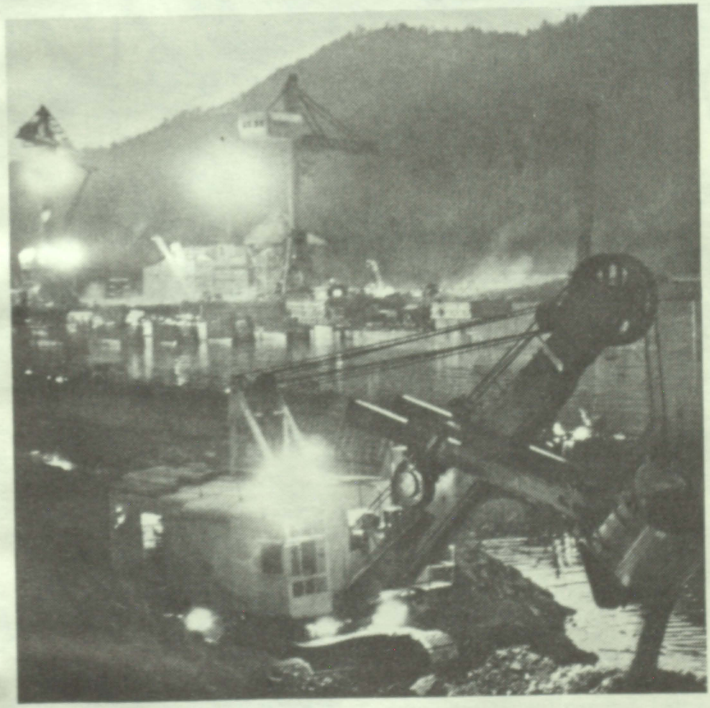
They call the Baikal-Amur railway the road to the 21st century. It is being built in sections up to 100 km long; some of them are already in use.



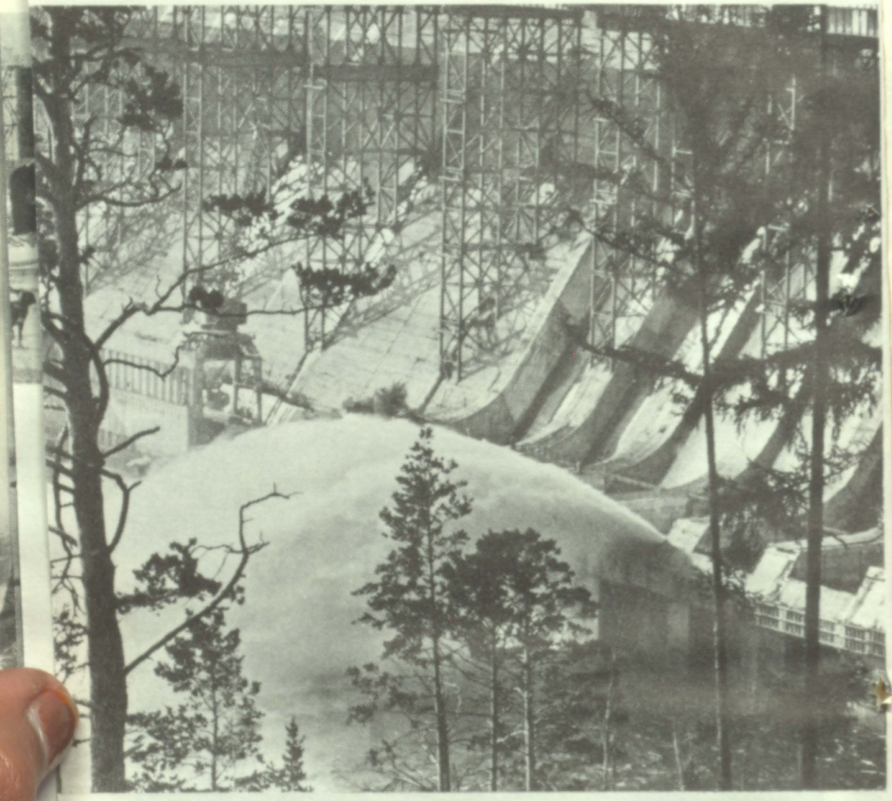


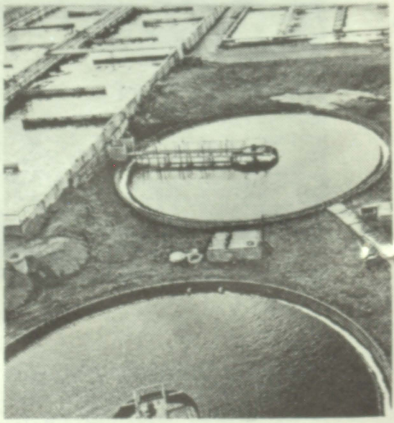
Western Siberia has oil, but access to it is not simple. To get to new deposits under the lakes and extensive swamps involves building up artificial islands and roads.

Planes and helicopters are the principal means of getting about in Western Siberia. They serve zones with a radius of 200 km or more, and not only take people to work, but even convey wedding parties (upper right photo).

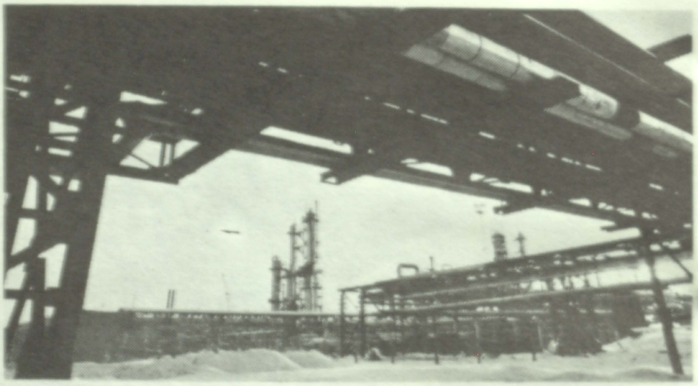


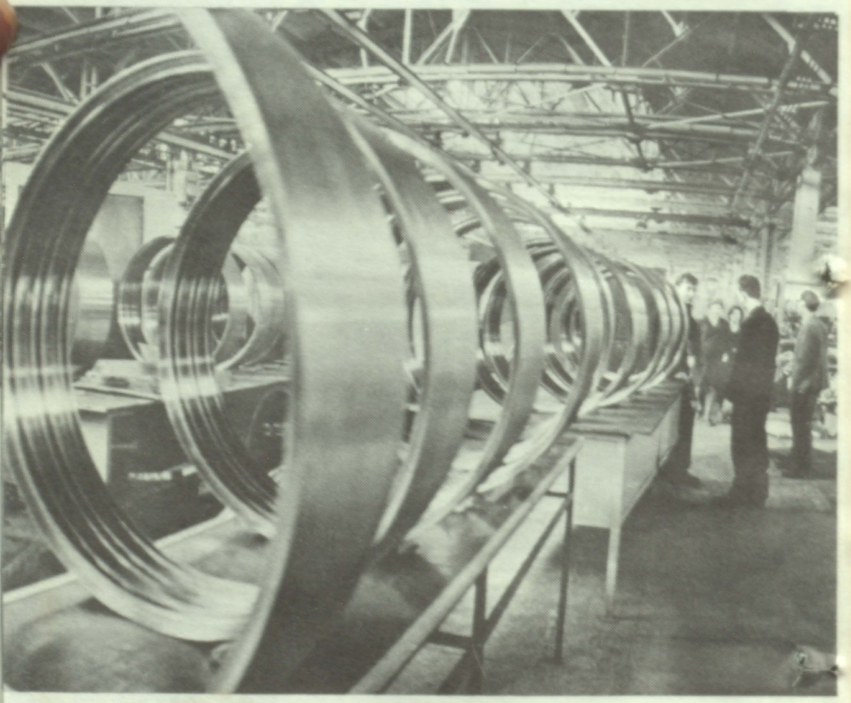
Machinery and equipment used on the construction sites is of the latest design, with advanced technological features, demanding of the work force a high degree of skill and know-how.





Forming a most important part of the overall plan for the development of Siberia is the programme for environmental protection. Large sums are allocated for reafforestation, and for installing closed-cycle water circulation systems at industrial plants, and special combustion systems to eliminate the discharge of noxious gases.





The optimal combination of different industrial enterprises in Siberia makes big savings possible.

Above — A gas processing plant near Nizhnevartovsk.
Below — Section of the electric motor works in Tyumen.

Above — The alumina plant in Achinsk.
Below — The administration building for the Ust-Ilim timber utilisation complex.

The cultural side of life is not forgotten on Siberia s construction sites The performances of travelling companies are always packed there are countless musical groups and of course, all kinds of periodicals and books are in great demand In Ust Ilimsk where workers from several socialist countries are numerous the book bazaar caters for the different languages and has a wide variety of reading material

Practically every Khakass settlement has its own singing story teller Every year there are regional and district get togethers of these folk historians who compete in recounting epic tales and in improvising new narrations Besides a talent for poetry they have a phenomenal memory Some can recite up to fifty poems each nearly as long as The Iliad

From the place where the hydroelectric station is being built to the village of Shushenskoye is about 60 kilometres Lenin lived here in exile for three years at the end of last century

In Khakassia there is an astonishing mixture of old and new Alongside a modern construction works fishermen and hunters in the *taiga* will chop down a poplar trim away the bark and lop off the small branches and then hollow out the trunk so that it forms a narrow trough This is then steamed over a fire while wooden cross bar expanders are wedged in to widen out the sides After that it only remains to shape the ends and the bottom with an axe and there you have a long narrow and light craft like an Indian canoe for hunting and fishing It will slip between any boulders won t tip over in the rapids and will glide quietly over the *taiga* lakes And if necessary, the craft can be poled upstream against the river current Offer one of the hunters here the latest model power boat and he will decline to accept it as being useless for the mountain rivers

In the Khakass *taiga* the hunters observe certain customs Going into the *taiga* if the first hunter has good fortune he will share what he has obtained with the last comer because for the hunter coming in behind everything is much more difficult

If a hunter who has succeeded in securing a deer meets another hunter he will give him half the bag even if the other man is unknown to him

The Khakass will always help another person just as the whole country is now helping to build the Sayan Shushenskoye hydro power station in Khakassia And the starting up of the first turbine of the station in December 1977 was celebrated far beyond the borders of this regions

In the USSR the industrial development of new regions—the building of factories plants and power stations and the establish ment of mines—far from displacing the national minorities living in these areas creates conditions for them to retain their national distinctiveness and at the same time become acquainted with the latest advances in the world

From the very outset the Soviet Government s programme for the economic development of the country s outlying regions made provision for the training of qualified workers, technicians and

engineers from among the local inhabitants and the creation of a national core of intellectuals Written languages were created for the peoples who did not have them and this work undertaken by Russian language experts was greatly helped by some of the more educated representatives of the national minorities Now universal literacy among the minor nationalities of the USSR has long been an established fact In the national regions schools and other edu cational establishments have been built where the instruction is in the native tongue

Many of these small national groups now have their own national literatures An interesting writer and poet is Yuvan Shestalov who is a Mansi a national minority living in Western Siberia His first book was also the first book published in Mansi the language spoken by about 8 000 people But Yuvan Shestalov s works are read by millions—in translations into Russian Ukrainian Georgian and the tongues of other peoples of the USSR

Take for example the inhabitants of the Far North (the Chukchi Eskimos Nanais Evenki and others) They preserve their traditional occupations of reindeer herding fishing and hunting for seal walrus and fur bearing animals But today this activity is organised in a different way on a collective basis Fishing co operatives have launches and motorised schooners The reindeer breeders have at their disposal caterpillar track runabouts demountable houses and portable radio stations Members of the work teams live permanently with their families in well set up settlements complete with hospitals schools and recreation centres They have modern homes with electricity and radio and many though not all as yet—can watch television relay transmissions And the more the regions being opened up for industrial development extend up into the North and to the East the more the peoples comprising the minor nationalities are drawn into the high tempo of development obtaining over the country as a whole

But let us return to Khakassia for another glimpse of a place about which no mention could be found in a pre revolutionary reference book Before the October 1917 Socialist Revolution the Khakass were nomads who raised sheep and long horned cattle and who had no knowledge of industrial production Now the Khakass Autonomous Region has more than a hundred industrial enterprises And instead of the former illiteracy which was total there are now 420 schools providing a universal full secondary education, as everywhere in the USSR

BAM road to the future

Writing about the Baikal Amur Railway always presents the risk of not being quite up to date The construction of the 3 200 km line, a distance longer than from Moscow to Paris is proceeding at such a pace that figures reported today are already out of date tomorrow

Celebrating the fourth anniversary of their arrival at the BAM project (the construction work began in the summer of 1974) Yevgeny Chetvernin team leader at the Severo Muisk tunnel broke a bottle of champagne against the shield to the accompaniment of applause from the workers In four years of work Chetvernin s team had bored their way into the mountain at the rate of 250 metres a year and had now achieved one kilometre And it was something to celebrate for every metre of the going had been through solid granite

BAM workers joke that they are building not a railway line but bridges which are later connected up with stretches of track There are indeed a lot of bridges Their total length amounts to 32 kilometres or one per cent of the whole length of the line

And the tunnels account for another one per cent The four longest will total 25 and the longest of these—the Severo Muisk (15 3 km)—will also be the longest tunnel in the USSR

All of this work is being carried on in harsh climatic conditions and in a seismologically active zone Summer heat of 30 C and winter temperatures of 50 are the usual thing and so are earth tremors

Three quarters of the track will be in the permafrost zone where the ground below the surface remains permanently frozen as hard as concrete even in summer Advantage is taken of this ready made asset which provides a firm foundation but care has to be taken not to disturb the topsoil or the ground will thaw and turn into an impassable bog When building roads therefore or railway lines the surface is overlaid with a generous coating of gravel and other ballast

There are problems enough on the BAM project The tunnel builders of the Baikal section alone use up about 100 tons of fuel a

day And they require much else besides including cast iron tubing and other awkward loads that can be delivered only by 30 ton road haulers For such big machines and for petrol tankers good roads are required But the building of these cannot be started until the appropriate section of BAM track is laid Meanwhile it takes the haulers five days to travel the 400 km section of the way There are waterways it is true but their use is limited to the brief Siberian summer

The BAM railway is being built in sections of up to 100 km in length each of which calls for a large number of workers But the BAM administration does not complain of any labour shortage The recently uninhabited *taiga* now has 120 000 people working in it and the whole of the BAM work force numbers 200 000 with the average age being 25

From among the youth who decided to join the construction project territorial detachments were formed in the various regions and republics of the country with specialists of different kinds making up the core

Whose Idea was BAM?

The idea of building main transport arteries arose more than a hundred years ago, when the first railway lines were being laid in Russia Projects appeared for Trans Siberian and Trans Asiatic routes In 1906 a plan was also drawn up for a forerunner to BAM an artery called the North Baikal line However to carry it out in those years was unrealistic At the end of the twenties and beginning of the thirties the project was considered again In 1940 the planning of a BAM project was finalised and approved and the first kilometres were laid Then the Second World War intervened and the work had to be stopped

Planning and exploratory work on the railway project began all over again in 1967

Why wasn t the old plan taken up?

The reason of course was that much had changed in the course of 35 years Steam engines had disappeared to be replaced by locomotives of far greater capacity, and construction workers had begun to work in permafrost conditions and in areas of high seismic activity, and they had accumulated experience in building long tunnels and large bridges Finally there was a much greater appreci ation of the importance of environmental protection measures As a result, the 1967 plan meant that the building of the project would

proceed at a more advanced technological level in keeping with the requirements of the 21st century

BAM is now being built from bridge to bridge and from tunnel to tunnel Every year sees another 320 km of line or thereabouts come into service The first part of the plan to be completed was the line called little BAM running from the existing Trans Siberian main line up to Tynda and further north to the coal deposits of South Yakutia

At first all building components and materials (even cement and sawn timber) had to be brought to BAM across the whole country which was inconvenient and costly So a large plant was built in Taishet for fabricating reinforced concrete items and a plant for repairing road building and construction site machines A whole construction industry complex was built near Shimanovsk

But construction plant and various kinds of equipment still have to be brought in from all over the country And some of the machinery has to be imported

What is the Need for the Railway?

An old Yakut Terenti Amosov once told his grandson the legend according to which God in creating the world was passing over Siberia His hands were numbed by the cold and he let drop on the earth an incalculable wealth Vexed he made sure that people would never be able to get to this wealth

Today Vitaly Amosov now a geologist recalls how his grand father spent his whole life in different parts around Neryungri where under a thin layer of soil there is a deposit of 40 000 million tons of coking coal—a quantity twenty times the amount mined each year at present in the whole world Vitaly Amosov did not himself participate in the prospecting of this deposit But here in the south of Yakutia there are big ore deposits containing up to 40 per cent of iron and he is directly involved in the work of exploring these

Such a combination of rich resources of coal and iron ore is a rare enough phenomenon in the world and although the existence of these deposits was known long ago for all practical purposes they might as well have been on another planet But BAM has opened the way to the exploitation of this coal and iron ore wealth of Yakutia

At the present time work is proceeding in Neryungri on prepa rations for the mining of the coal Initially 12 million tons of coal a year will be extracted here Construction work is also proceeding on the first section of a 640 megawatt thermal power station These operations constitute the first link of a future South Yakutia territorial production complex

All told there will be about ten such complexes around the Baikal Amur railway In the immediate vicinity of the trunk line there are rich deposits of copper and apatite phosphorites and mica and the raw material for potassium fertilizers However the quantities of useful minerals prospected close to the line represent only an insignificant part of the immense wealth contained in the ground of Eastern Siberia and the Far East

To the north of BAM lies the Lena Vilyui gas bearing province which according to some estimates will prove to contain as much natural gas as Western Siberia Still further to the north there are alluvial gold deposits and diamonds In all the BAM territorial production complexes as we have already indicated will occupy an area of one and a half million square kilometres that is more than 5 per cent of the territory of the USSR That is why some refer to BAM as the railroad with no end But there is another more popular and more accurate—description the road to the future

The promise held out by this future includes not only a new step forward in the economic and social development of a huge region of the country but also new prospects for broad international co operation The BAM construction work is tied in with the joint long term programme of co operation of the member countries of the Council for Mutual Economic Assistance They are interested in hastening the completion of the new railway which will enable the Soviet Union to utilise the raw material resources of Siberia for the manufacture of products for export Important among these re sources will be coal copper mica asbestos and timber

Foreign business interests have already calculated that no other route can match BAM for the prospects it holds out for international co operation in transportation To ship goods across the Soviet Union from Niigata Japan to Rotterdam, Holland for instance provides a 35 40 per cent saving in distance over the traditional sea routes via Suez or Panama Already the Trans Siberian railway is taking containers to Europe with Japanese Philippine Singapore and Hongkong cargoes But it does not have the capacity to meet the growing demand of foreign firms BAM will meet this need

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People have different visions of the future The Soviet one is characterised by optimism In building the Baikal Amur railway therefore the Soviet people look forward not only to the help it will provide in overcoming the immense distances inside the USSR but also to the possibilities it will offer for drawing the countries of different continents closer together and for strengthening good neighbourly relations and co operarion

Science moves East

In 1957 the world was set agog by the Russian miracle the launching of the first sputnik This event overshadowed another one also significant for the USSR In those days an area of the taiga near Novosibirsk became the launching pad for Siberian science with the building of the town of Akademgorodok Thus was born the Siberian branch of the USSR Academy of Sciences

In the Tenth Five Year Plan period (1976 1980) industrial production in Siberia increased by 50 per cent Siberia accounts for the entire increment in the production of gas and aluminium and a considerable part of products put out by energy intensive chemical plants timber and pulp and paper products and others needed by the national economy

The foresight of the policy of hastening the development of science in this region is already evident All the principal fields of study in the natural sciences and the humanities are represented in the Siberian branch of the USSR Academy of Sciences In several directions in the sphere of fundamental research the branch occupies a leading place in world science Siberia now has a scientific work force of 35 000 engaged in its research institutes and scientific departments Science is providing a powerful impulse for the development of the eastern regions of the country

The main organisational principle observed in setting up the Siberian branch of the Academy was that of comprehensiveness which predetermined the high degree of efficiency of scientific work there At the present time fifteen comprehensive programmes of fundamental research have been drawn up dealing with the application of mathematical modelling techniques turbulence microelectronics laser physics and laser technology catalysis and molecular biology They are aimed at providing the scientific foundation for making Western Siberia the main base of the country for the extraction of oil and gas and for exploiting the natural resources of Eastern Siberia

Exploratory work the application of research findings and

laboratory investigations and the introduction of results into practice are carried on jointly by the various institutes of the Siberian branch of the Academy of Sciences and Siberian industry There is also long term co operation with USSR ministries Another way in which close links are developed between science and industry is the joint work carried on by scientists with branch organisations and design offices on wide ranging problems

On the basis of studies carried out by economists long term forecasts are made and programmes and recommendations drawn up for the development of Siberia s productive forces One of these programmes is for the creation of a Kansk Achinsk fuel and energy complex

To help develop the territory without damage to the environment this was the task given to the scientists when the Siberian branch of the Academy was set up They have drawn up economico mathematical models providing for the optimum lo cation and development of different branches of production and of territorial production complexes and investigated the problems associated with the economic exploitation of promising regions of Siberia and the Far East A seismic map of Siberia has been completed and the area along the BAM track has been evaluated seismically for the benefit of the engineers A comprehensive study has been made of Siberia s surface and subterranean water resources

Nature here is exceptionally sensitive to damage It takes three times longer in this region than in the central zone of the European part of the country for the self purifying action of the water and soil to take effect Trees and bushes grow at a much slower rate and it takes a long time to re establish the ground cover when this has been destroyed At the same time the opening up of the land is proceeding on an immense scale Non standard problems require non standard approaches to them which often lead to discoveries

Scientific work in the region began at Novosibirsk Leading scientists came here and laid the foundations for new institutes The selection and training of young people for scientific work was done systematically—by special contests at ordinary schools through special schools with emphasis on physics and mathematics and through the Novosibirsk and other state universities

Based on Novosibirsk University and the research institutes of the Siberian branch of the Academy of Sciences a system was set up for training personnel for the scientific centres and higher education institutions and for the industry and agriculture of the whole region Already at the first stage of their study and training students take

part in the work of the research institutes This is one more of the secrets accounting for the high returns received from Siberian science In a short period of time 500 doctorates have been awarded and 4 000 Candidate Doctor degrees Not infrequently a graduation thesis opens a new avenue in science

All this made it possible to assign scientific groups headed by doctors of science to the North and the East There new scientific centres have been set up for instance in Irkutsk which are concerned with a wide range of problems associated with the economic development of Siberia taking into account the special geographic economic and demographic features of the different regions of this area

A scientific centre has been set up in Yakutia the Soviet Union s northernmost Autonomous Republic The recommendations of local experts on the special problems posed by permafrost zones have been followed in laying gas and oil pipelines in the Far North and on the BAM project

A Buryat department of the Siberian branch of the Academy of Sciences has been opened The work done by Buryat physicists on the propagation of radio waves has made it possible in particular to bring television to the previously out of reach mountain regions of the Buryat Autonomous Republic as well as the border areas of the neighbouring Mongolian People s Republic

Finally a Far East department of the USSR Academy of Sciences has been established based on the Siberian branch Its institutes together with others are successfully tackling problems of research in the fields of marine biology vulcanology and the seismic processes taking place in the earth s crust beneath the ocean

The expanding network of scientific centres says the head of one of them Academician Nikolai Semyonov will take in the whole country in the near future

Opening up the North

What do we mean by the North? To apply the term mechanically to all regions situated above a certain latitude would be wrong At the latitude of the European section of BAM for instance the climate is temperate But there is one factor common to all the northern regions that can be used as a measure they require a greater than normal expenditure of energy A person needs more calories machines use more fuel and houses need more heat

In its scale and scope the present opening up of the North far exceeds any of the world s gold rushes of the past At the same time the North has the most unstable biophysical system of any region of the planet It is so delicately balanced that the slightest upset to the equilibrium is fraught with far reaching ecological consequences

Up until fairly recently if not among ecologists then among some of the administrators involved in the development of the Siberian expanses optimism reigned Siberia was boundless practically untouched by man they said Put all the cities and towns and industrial enterprises together and they would occupy only an insignificant corner of the whole region Moreover there was the self purifying capacity of the mighty Siberian rivers and the regenerating capacity of the forest

A reminder that the state of affairs is not quite like that was given by the unique and in many respects mysterious Lake Baikal The world s deepest lake it contains as has already been noted one tenth of the fresh water resources of our planet and is so clear the bottom can plainly be seen in the shallower parts at a depth of a few dozen metres Many species of plant and animal life are unique to Baikal

Some years ago several quite large industrial enterprises were built on the shores of the lake which reacted unfavourably to the

presence of the foreign bodies The situation in no way resembled that to be observed in the case of Lake Ontario Outwardly Baikal retained its former transparency but scientific investigation showed that after a time the lake s self purifying capacity could become impaired

Specialists sounded the alarm and public opinion supported them Thousands of letters were sent to the USSR Supreme Soviet and to newspapers Practically every week saw articles in the central press expressing anxiety over that gem of Siberia

The preservation of Baikal was in the forefront of attention as a matter of national importance A comprehensive government pro gramme was drawn up covering the whole area of the Baikal basin Of the many measures taken the most important were the installation of purifying equipment at the plants (which cost more than the actual building of the enterprises themselves) and the decision not to permit the building of any further plants or factories here

In 1974 Regulations were promulgated for protecting the waters of the lake and the natural resources of the basin feeding it These Regulations laid down the measures to be taken to ensure the protection and rational exploitation of the waters land and forest of the Baikal area and the fish and animal life and defined the extent to which the territory and certain stretches of the water of the lake could be used for the purposes of recreation and tourism

The example of Baikal shows how susceptible the primordial nature of Siberia is to damage and how costly the mistake of relying upon the restorative power of nature alone Now before embarking upon any new undertaking special ecological studies and other investigations are made beforehand What is the likely result of the intrusion of industry into this or that area? What can be done to minimise its effect on the environment? The fact is that it is not possible to move into a region and leave nature entirely untouched

This also applies to the territory lying along the route of the Baikal Amur railway Viktor Solonenko Corresponding Member of the USSR Academy of Sciences who is well acquainted with the BAM project told about a small larch he cut The diameter of the stump was about 15 cm and it had approximately 200 rings To attain such modest growth in this severe climate therefore had taken some 200 years

Here if the surface is denuded of its cover of moss the permanently frozen ground will turn into a bog

So it will be appreciated that the land through which the railway passes has to be treated with the greatest care

For the first time in world practice a comprehensive geographical

report has been drawn up covering the future of the BAM region up to the year 2000 It makes it possible to foresee the effect of man s interference on natural processes and to draw up concrete recom mendations for the planners

The problem of environmental protection is no less difficult in respect of the other northern regions The exploitation of the oil and gas deposits in Western Siberia has brought large numbers of people there and a mass of equipment and machinery

Naturally with such large scale development the environment of the West Siberian plains cannot remain untouched Passing through areas where the ground is permanently frozen the warm gas pipelines cause the ground to swell degrade the structure of the soil and bring about erosion And unavoidable damage is also caused by the drilling for oil and gas road building and the laying of oil pipelines and the discharge into the atmosphere of the products of the combustion of waste gases

More than ten years ago ecologists began intensive studies of Western Siberia with the aim of determining the most advantageous forms of development that would have the least impact on the environment A nature protection programme was drawn up which, among other measures prohibited the transportation of oil on the River Ob and provided for the collection of oil field gases and their utilisation by the Surgut thermal power station thereby minimising water and atmospheric pollution Where the land has been damaged by digging mining etc extensive work is stipulated for it to be restored

A New Battle for the Geographers

A serious conflict once arose over developmental planning On the one hand there was the important and powerful Moscow hydrological institute, which is concerned with the planning of hydroelectric stations and opposing it were scientists of the Institute of Geography of the USSR Academy of Sciences The geographers objected to the proposed building of a large hydropower station on the lower reaches of the Ob The station would supply more power than all the hydroelectric stations on the Volga taken together and it would be very cheap energy much needed for the development of the vast territory of the North

But the geographer ecologists showed that the reservoir formed on the Ob would flood a vast area of the northern plains and destroy millions of hectares of *taiga* and the cold breath of the Arctic Ocean

would be brought a thousand kilometres further south upsetting the whole climate of the region

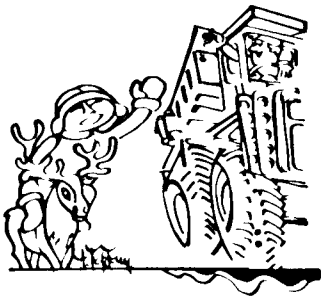
The USSR Council of Ministers accepted these conclusions and the plan for building the station was scrapped

In the USSR and in the USA designs are being worked out for undertakings of immense scope involving reversing the flow of northern rivers to the south where there is maximum sunshine and warmth but very little rainfall In the USSR it is hoped to water and bring back to life about 20 million hectares of desert land by diverting some of the Siberian water to replenish weak local rivers in the south and by creating new reservoir areas and building new canals in Kazakhstan and Central Asia

But the carrying out of projects of this scale could have far reaching and possibly global environmental consequences The whole question is being exhaustively studied therefore and that is why some of the plans have been pigeonholed for the time being

Academician Innokenty Gerasimov Chairman of the National Committee of Soviet Geographers emphasises that a plan will be approved by the government only when all question marks as to the safety of nature have been eliminated

Why they stay in Siberia



Sergei Lysyakov and Pyotr Grigoryev, steeplejack construction workers on the Ust Ilim hydroelectric project were invited as specialists in their trade to work in Moscow on the restoration of the Kremlin towers After the job was done they were given the opportunity to stay in the capital to live and do specialised work While appreciating the honour they nevertheless declined the offer saying 'Ust Ilimsk is waiting for us"

They say that it usually takes at least ten years before a person who has settled in a new place acquires a sense of local patriotism In Ust Ilimsk newcomers feel themselves to be old residents in a much shorter space of time

Take Yuri Fedotov for instance who came here from the city of Gorky on the Volga He is a builder by profession but is now the first chairman of Ust Ilimsk s City Soviet He was nominated for the job because of the special qualities of temperament he displayed on the construction project and because he would always speak his mind directly about shortcomings and omissions in the work

Ust Ilimsk is a beautiful town white amidst the green expanse of the *taiga* It is only five years old but it is already making a significant contribution to the economy of the country The powerful Ust Ilim hydroelectric station is the third in the Angara series Construction of a major timber industry complex including a large pulp and paper plant is proceeding with the assistance of the CMEA countries And then there is the construction of the town itself In all this the young town in the *taiga* can take legitimate pride

A young town with young residents whose average age is 26 Once you could get to it only by plane but now there are rail and road links too

Siberia has long had to rely upon the populations of other regions to supply an inflow of people and the sociologists say this will continue to be the case in the future too Already today people are making their way overland by river and by plane to Kodinsk the site

of the future fourth hydroelectric station on the Angara—the Boguchansk in just the same way as they flocked recently to the construction of the Ust Ilim station the history of which illustrates the growing scale of the migration

This history began at the end of November 1962 when seven men were deposited by helicopter on a rocky promontory called Tolsty By January 1965 the small settlement of Ust Ilimsk had 178 residents and by the beginning of 1978 it had grown into a town of 50 000 with the population continuing to grow each year

Town building in Siberia is much more expensive than in the European part of the USSR With the actual buildings walls have to be made thicker and underground mains and drains have to be laid at deeper levels Then there are the greater outlays that have to be made by the state to attract labour to the region and provide all the amenities necessary for normal work recreation and study In fact living conditions should if possible be even better than those in long settled areas so that the people coming here—and particularly the youth will have an incentive to stay on and possibly settle permanently

Though the town might be costly for the state for the residents it is not an expensive place to live in said Yuri Fedotov For rent and services etc they pay the standard rates that apply in all regions of the country 4 kopecks per kilowatt hour of electricity 16 kopecks a month for each member of the family for gas (any quantity) and just over 13 kopecks a month per square metre of living space for rent And they have the advantage that wages in Siberia are considerably higher than the comparable rates in the European part of the USSR

From the shores of the huge reservoir formed for the Ust Ilim hydropower station you get a clear picture of how the town is growing For the five year period ending 1980 Ust Ilimsk received nearly a million square metres of living space

We asked Yuri Fedotov what this fugure meant in practice bearing in mind the inevitable growing up of the residents of the town

This has been allowed for by the planners and architects Ten of the hostel type buildings already built, and eight of those under construction initially serving small families are planned in such a way that after a year or eighteen months when the family increases it will have a separate flat to itself Our aim is to have the housing problem solved in the main by the time the principal industrial projects have been completed

Can you tell us what was actually achieved in the town over the last year?

Well, it makes up quite a long list but here are the main items housing 100 000 square metres of floor space two crèche and kindergarten complexes a shopping centre serving cultural and educational needs two large cafes a men s clothing shop a beauty parlour for the women and a furniture shop Other important projects completed were a library a club for the youngsters with very good technical facilities for hobbies a stadium with seats for 3 000 a recreation centre and a school for 1 560 The school has 40 class rooms a sports complex including a swimming pool and a garage for a class teaching driving

In our planning we took note of the mistakes made by our older brother Bratsk You can see how in our town some of the buildings are lined up symmetrically some rise on small hills and others follow the contours of the hollows so that there are many different levels The architects have made good use of the natural relief greatly enhancing the urban landscape

Besides each building has its own grounds and planted squares delineate each block so that the town blends harmoniously with the forest surround and vice versa

On Sundays young parents stroll with their prams along asphalt paths leading into the forest What we are very short of in Ust Ilimsk however is grannies There are no more than 2 000 pensioners so as you can imagine baby sitters are in great demand Especially so when you consider that our baby population increases by nearly 2 000 every year which makes Ust Ilimsk a city with one of the highest birth rates

The children grow up presenting new tasks for the town The milk plant has to be enlarged, and we must proceed with an ice cream factory At present ice cream is brought 250 km from Bratsk and the demand greatly exceeds the supply

We ve made an inland sea and now it only needs the sailors Little by little we re acquiring yachts and small sailing craft A yacht club was formed recently and already you can see quite a few sails on the water And very recently as it seems the first downhill skis appeared in the town Now on fine winter days hundreds of enthusiasts go up onto the slopes of the surroundhills where paths have been cleared to make runs and ski lifts have been built So you can see that we re not so badly off not behind long established towns and cities

Yuri Fedotov went on to tell us about the various celebrations that had become a tradition for the town—one for the sea held on the banks of the reservoir, music festivals for the many ensembles popular among the young people and a festival for seeing out the

Russian winter with pole climbing contests and the traditional samovar and pancakes

The Ust Ilimsk old timers no longer go to the continent for their vacations It just doesn t appeal to them More often than not they holiday in the *taiga* by organising a hunting trip That s what I do myself Yuri Fedotov confided A helicopter drops us some where in the depths of the *taiga* and we have several weeks hunting chasing after valuable game The scale of everything here is on a par with the spaciousness of the land Take an industrial complex it s one of the biggest If it s a power station it s the most modern of its kind If you go after mushrooms or go fishing you don t take a small basket with you but a sack And if you should settle here per manently instead of a summer shack by the lake you put up a two storey house with all conveniences We have forest in abundance but there s a shortage of good black earth What there was in the surrounding area we brought to the town for planting shrubs and trees Now we have to go up to a hundred kilometres for it

We came out onto the main street Trucks of all kinds sped along with cement concrete building panels steel framing for the pulp and paper plant and black soil Planting in the squares and streets is keeping pace with the building

CMEA co operation... and the romance of pioneering

Siberia has long participated in the international division of labour, putting various products of the national economy onto the world market Now for the first time in this difficult land the socialist countries are co operating in building one of the biggest industrial enter prises of its kind in the world—the huge Ust Ilim timber utilisation complex

Some years ago forestry specialists and economists drew atten tion to the ever growing shortage of commercial forest resources in the world Their apprehensions proved to be well founded The crisis that arose in paper production fell not far short in its scale of that experienced in the energy sphere

The socialist community countries were not caught unawares Long before the appearance of the first signs of a raw materials crisis they had worked out a series of joint measures for increasing the capacity of the pulp and paper industry And first among these measures was the conclusion of a general agreement on the building of a pulp and paper plant in Ust Ilimsk The enterprise which will produce 500 000 tons of bleached pulp a year is being built co operatively on the basis of compensation agreements as they are called

The plant will form part of a major timber utilisation complex Construction is proceeding using the resources of six socialist countries belonging to the Council for Mutual Economic Assistance—Bulgaria Hungary the GDR Poland Romania and the USSR The Soviet Union has done the technical design work The participating countries are supplying plant equipment and labour in return for which they will receive future deliveries of pulp In Ust Ilimsk in the streets and shops and on the construction sites you hear men speak in Hungarian Romanian Bulgarian Polish and German Three national youth detachments are building the plant alongside Soviet workers They are named after Georgi Dimitrov

(Bulgaria) Béla Kun (Hungary) and Ernst Thaelmann (German Democratic Republic)

Is there a manpower shortage in the Soviet Union then and a surplus in these socialist countries?

This is not the explanation for all the socialist countries have full development programmes with big demands for labour and they have no surplus manpower In the Soviet Union there is a shortage of labour in some branches of the national economy But the difficulty is resolved not by bringing in workers from abroad but by raising the efficiency of production and by extensive efforts to find and make use of hidden reserves

The presence of foreign workers in Ust Ilimsk is explained by economic expediency or to put it more simply mutual advantage Deliveries of Ust Ilimsk pulp will enable the countries participating in the construction of the plant to reduce their purchases of this expensive commodity on the capitalist market The point is that of the CMEA countries only the Soviet Union has large coniferous forest resources of the type needed for producing high quality pulp

This temporary labour force from the socialist countries works in Siberia on an equal footing with Soviet workers Bulgaria has sent experienced drivers and Hungary and the GDR have provided carpenters concrete handlers and finishers They do the same work as their Soviet counterparts with the same qualifications And of course they receive the same wages etc including the substantial premiums provided by the Soviet Government for workers in remote localities with harsh climatic conditions

But the fact—perfectly logical though it is—that the USSR has nationals of other countries working on some of its projects has been seized upon by Western journalists to concoct stories about the vicious methods employed by the Soviet Union in exploiting hired labour from other socialist countries and they conclude that there is no difference between the workers from the CMEA countries coming to the Ust Ilimsk project and the *Gastarbeiter* (guest workers) in a number of West European countries The apparent aim of these falsifications is to make it appear that the exploitation of foreign labour is a universal phenomenon characteristic of both capitalist and socialist society

Not a word is said about the fact that the countries of the socialist community sent their *best* workers and specialists to Ust Ilimsk and that for many sponsorship by their respective national youth organisations was in the nature of a reward In the case of Bulgaria for instance there were five applicants for every place. And all these people were well placed with jobs in their own countries, and had no

need to abandon their homelands to search for work in foreign lands

In the Soviet Union they are subject to the same labour laws as Soviet workers and enjoy the same benefits including paid holidays and sick leaves etc Many advance their qualifications by attending evening classes or by taking correspondence courses including higher education studies On completing their term of work, they leave the Soviet Union not only with a Soviet diploma but also with good money (higher wages than they would have received at home) and with additional valuable experience

But let us see what some of the workers thermselves say

Uwe Betel from Freiberg (GDR) I think that every person should undertake something or other in his youth that he can take pride in later on for the rest of his life For me personally and possibly for all the construction workers from the GDR this was the main reason why we decided to set off for Siberia To take part in such a project and especially in such an unaccustomed climate is all good experience and a real school of life Ust Ilimsk has proved to be such a school for us

And a wonderful school of friendship added Lyubomir Iliev a driver from Bulgaria Before meeting each other on the banks of the Angara we heard a great deal and read about how the people of our age lived in the fraternal countries But here after having been together for several years we have really come to understand one another I give special thanks to the Siberians and am glad to have had the opportunity to learn about this region and come to know its people not as a tourist, but at first hand as a participant in a big undertaking

Many of the participants in this international building project will always remember the years spent in Siberia Ust Ilimsk is populated in the main by young people so there is a lot of entertainment in the evenings with instrumental ensembles and dancing and sports competitions are also very popular The main attraction in the summer is to go tramping in the forest make genuine fish soup from the Angara grayling and relax in the evening with songs around a camp fire

Quite a few also find personal happiness here In the Hungarian hostel for instance there is a big sheet of drawing paper on the wall with 68 names on it 34 Hungarian and 34 Russian Ukrainian and Byelorussian It is a list of the newly weds

How s life? I asked József and Lyudmila Mátè Ust Ilimsk s first Soviet Hungarian family

Fine Our daughter Natasha is growing fast A year ago we made a trip to Hungary Granny didn t want to let her granddaughter

go back again to Siberia But we want to carry on with the job until the first section of the plant is working Then we ll go to Hungary

The young families are helped by the town Soviet of People s Deputies and by the trade union They get accommodation straight away and the children are placed in crèches and kindergartens

For the Bulgarian Hungarian and German youth work thousands of kilometres from home is not just a brief sojourn or interlude but years of their life None of them would think of packing up and going home before that hour they all look forward to when the plant is set into operation and producing pulp

Each one taking part in building the giant timber complex on the Angara is aware of being a pioneer of starting something from the beginning This is what the leader of the Hungarian detachment István Hanyec said on this score (incidentally he graduated from the Moscow civil engineering institute married a Russian fellow student and took his wife and two children to Ust Ilimsk)

It is in this town on the Angara (so far the only one!) that the contours are emerging of a new model of relations between the CMEA countries in the context of socialist integration And all of us working here have been very fortunate After all in our own way we are the advance guard of our future As the years go by this movement will become general but the town on the Angara will always remain as the cradle marking the new model of our co operation

The Siberians

The elemental strength and boldness of the early Russian explorers who within a short time opened up and settled Siberia still remain the hall mark of the people living there The centuries that have elapsed since those first ex peditions have shaped a spe cial kind of man who com bines the sagacity of the Siberian peasant skill in whatever job he tackles a sense of obligation and com radeship that imposes no con ditions and a deep love for his land

Siberia has long been warmed by its kind hearted people who have brought life to its vast expanses Without this quality the Siberian would not be a Siberian New settlers revolutionaries and free thinkers driven at some stage to live in this immense forbidding region together with the native inhabitants formed with time a Siberian type of independent industrious and courageous people

In conquering the *taiga* the future Siberian inured himself to long periods of work without tiring He knew that he had to rely upon himself But privation did not harden his heart On the contrary it heightened his sympathetic concern for the welfare of his comrade battling somewhere alongside him in the forest The friends and comrades would gather together for a smoke and to drink tea or vodka and then set to again with an axe Together it was easier to put up an *izba* (peasant type cottage) and the back breaking work of clearing the forest seemed lighter

To this day the determination and strength of character of the Siberians are features that strike the observer

One winter day in Siberia writes Bart McDowell an American journalist I met a man fishing through the ice of the Amur River He had caught five fish more than any of his companions What was his secret?

No secret he said through chapped and stiffened lips No secret only endurance

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In Siberia as perhaps in no other place the people are noted for their honesty and responsiveness to one another Here the principle of fellowship is observed faithfully and tirelessly raising comrade ship to a level short of which it would have been difficult or altogether impossible to develop Siberia in the way it is being built today

In the North the worst thing imaginable is loneliness That is why, in the past a Yakut would wish upon his enemy That not even a mouse will pass near you that no bird will settle alongside you!

The immense northern distances and inhospitable climate teach the value of human companionship

How many friends have you got? a young Yakut asked me once Somewhat taken aback by the question I thought for a moment and answered Well I suppose about a dozen perhaps one or two more

Why so few? exclaimed my hospitable host quite astonished There you live in a big city with so many people around If I lived there I would have thousands of friends!

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The names of Siberians were forever inscribed in the history of the Soviet country in the autumn of 1941 when the Nazis were peering through their binoculars at Moscow The outstanding unassuming valour of the Siberians their customary coolness in a situation where death stared them in the face and finally their steadiness of hand and aim and physical endurance won for them in the battles near Moscow unparalleled fame as defenders of the capital An older friend of mine who went through the war told me Among the new recruits—and not only among them—the Siberians stood out im mediately For one thing they handled weapons with assurance which was understandable because every one of them was a hunter brought up in the forest But they were also distinguinshed by a kind of general quickness on the uptake and a special aptitude for military action They quickly got the idea of where to dig in and had a talent for camouflage You could see straight away Ah! they re from the *taiga*

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There is a special feature of the newly developing regions The breaking of new ground and the unexpected nature of the problems that arise produce a kind of natural selection of specialists To be a good engineer for instance it is not enough just to be possessed

of a store of knowledge One must also be capable of assuming responsibility Nowhere else other than in Siberia are there so many young directors and chief engineers of plants and factories so many young people in charge of building projects and geological surveys

Such a one is Farkhan Salmanov an Azerbaijanian from Shamkhor a member of the Communist Party Hero of Socialist Labour Lenin Prize winner and renowned geologist one of the first discoverers of Western Siberia s oil He is fifty now

We recall an episode of his earlier years which incidentally has served as the subject for many books plays and films The young geologist Salmanov had put a team of drillers onto a barge with the object of setting off for Surgut Just at the critical moment he was handed a despatch from head office saying that the plan had been changed and that he was to return Salmanov said to the messenger

Listen I didn t see you You didn t see me We missed each other get it? And together with his drillers he sailed off for Surgut When Salmanov is asked today whether that is what really happened he replies I used even fewer words!

The drilling went on for a long time and still there was no oil But finally by the River Mega they struck a gusher which threw up 240 tons of oil a day Salmanov sent the news to Moscow in a typically expressive telegram which they still chuckled over years later for its colourful unofficial style

You can t manage in Siberia without a sense of humour In a freshly cleared cutting for the Bratsk Ust Ilimsk transmission line I saw a roughtly hewn pine board set up Several arrows were painted on it in bitumen with accompanying announcements Nearest bottle of beer—42 km Bath house—21 km Bears—17 metres (the distance to the edge of the cutting) And one arrow pointed to the north with the inscription To Ust Ilimsk 181 km Under it someone had scratched with a nail or chisel That s where we re going

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In the North Salmanov was able to create for his oil workers entirely normal urban like living conditions (sometimes even better than in the town) Once in order to help dry out the football field before an important match he sent a helicopter up to move about over the ground for several hours—a rather costly expedient Salmanov understood that the final match for the regional championship being played not in Tyumen with its 200 000 population but in their much smaller Gornopravdinsk, was a special occasion for all the geologists and that his action was well justified and would be recouped anyway

On several occasions he found himself paying substantial fines out of his own pocket for infringing fire safety regulations This was because of his stubborn insistence on preserving islands of natural forest in and about the settlement, whereas the regulations—sometimes overstrict and questionable—demanded a certain area of clear ground around the houses Salmanov appreciated full well that fir trees outside the window of a flat also brought their own dividends and that the simple fact was they were needed by people

• • •

What draws people to Siberia? High wages? A desire to be in the limelight ? A pioneering spirit? A wish to test oneself out? One can t give a simple answer to these questions Just as writers of the last century tried unsuccessfully to fathom the mysterious Slav soul so today sociologists psychologists and foreign visitors ponder over the Siberian phenomenon

When the Baikal Amur railway project was announced in the course of just a few months some 200 000 Soviet citizens mainly young people volunteered The recruitment bureau and all kinds of authorities and official bodies were deluged with letters Some of the keenest simply went to the construction area with rucksacks on their backs This eagerness to go East cannot be fully explained just by a desire for more money or even by a thirst for adventure

The young men and women building BAM and other projects in Siberia are naturally not averse to earnings or the honour that attaches to this work What distinguishes them however is their desire to live and work in a close knit collective the members of which are increasingly drawn together by their common endeavour in overcoming the special difficulties encountered under the testing conditions of these places They are characterised by a common determination to transform this region

Over the years the word Siberia has become synonymous with manly courage with personal dedication to a noble aim A land for real men is how Siberia is described by one of the leading experts on the region Academician Nikolai Nekrasov who is chairman of the State Planning Committee Council for the Study of the USSR s Productive Forces

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Mikhail Sukhorukov s story is typical of the present day Siberian He used to work as an electrician on the Kazakh railways Once some Komsomol members on their way to BAM travelled on his train Day and night they talked about the great construction project and about

Siberia sang songs and recited poetry When his train returned home Sukhorukov began pining feeling that somehow he was missing out on life Without wasting time thinking about the matter he too set off for Siberia Now he works as an electrician fitter in a housing construction team in Ust Ilimsk On his way to Ust Ilimsk he made the acquaintance of Tanya Kuklina and shortly thereafter they married In Alma Ata they had lived near each other but only met in Siberia And they don t plan to leave for any other place

I talked with another Siberian Anatoly Zarubin who is a crane operator I built the Irkutsk hydro station he said speaking unhurriedly and the next one at Bratsk and I m here now on the Ust-Ilim job Soon work will be starting on the Boguchansk station

I asked him whether he really intended going on to Boguchany after having lived here in Ust Ilimsk for seven years He seemed to be well set up with a three roomed flat a car and a family fast growing up First to answer my question was Anatoly s wife He ll be needed she said with a sigh We ll go

To start from the beginning again as a pioneer? Well from the journalist s point of view this might have a romantic ring but in practical terms of everyday life? I don t want to anticipate Zarubin s own reply but when he spoke about the new cranes that were to be used at Boguchany cranes which he was very keen to handle it seemed to me that he was as good as on the way already

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I keep recalling lines of a poem about the Bratsk hydropower station written by Yevgeny Yevtushenko reminding us that the machine technological progress is not everything No power station can help if our souls are without light

The following incident occurred about ten years ago in Bratsk Late in the evening into the hotel room where the poet was staying burst a man carrying his hat covered with snow Perspiration stood out on his forehead and there was an intense expression in his eyes He knocked his felt boots together to warm his feet

Comrade poet! he began pulling off his mittens We ve got a team working nearby The lads would like to listen to some poetry

How far is it?

Oh not more than 20 kilometres

But look it s night already!

The boys said they d wait while I ran to fetch you

In the fifties when the Bratsk hydroelectric power station was being built there was a general enthusiasm for study after the

working hours and this applied especially to the construction workers Take the brothers Shepilov Vladimir and Vasily for instance whom I happened to meet They were both married and the two young couples shared a flat between them It was a regular student fraternity Vladimir was taking a fourth year institute course Vasily was studying at a technical college Nelya—Vladimir s wife—was taking a course at a comprehensive training school and only Maria—Vasily s wife—was not studying She had already completed her studies and was teaching at preparatory courses for those wishing to enter institute They were very typical of Bratsk families And one might add of families in many other Siberian towns then and now

I remember another student Ivan Savelyev a powerfully built awkward youth with red hair He worked as a logger near Ust Ilimsk and had tried for several years running to gain admittance to the law faculty but without success He simply hadn t been able to do enough effective study dropping off over his text books after a heavy day s work But finally he managed and went to Irkutsk from where he wrote long letters to his former work mates telling them in detail how he was faring in grappling with international law and all the other subjects he had to study

Several years ago a doctoral thesis was submitted to the Institute of Geology and Geophysics in Novosibirsk The theme The distribution pattern of Western Siberia s oil deposits The author—our friend about whom we have already spoken Farkhan Salmanov

The dissertation was accepted and a fellow countryman a prominent geologist pushed his way through the crowd to hug Salmanov warmly and congratulate him saying

Azerbaijan is proud of you friend That s the real Shamkhor character!

Why Shamkhor? replied Salmanov narrowing his eyes Siberian character!

• • •

This happened at night In the Ust Ilimsk hospital complications arose in a maternity case necessitating a transfusion requiring a considerable quantity of group A blood with Rh negative factor A bare ten per cent of people have such blood so there are few donors An ambulance was despatched to the flats of the two such donors on the list but one turned out to be away on holiday and the other was absent working on night shift

While the transfusion was proceeding using the 800 cc of blood that was in the bank an appeal was broadcast over the local radio

But who would be listening at that hour? And then someone from the hospital rang a neighbouring hostel where the Hungarian construc tion workers lived

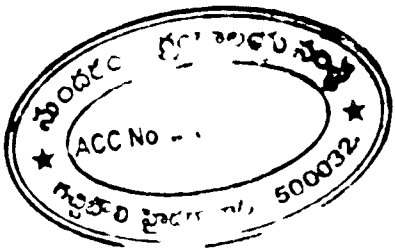
Hardly a few minutes went by before people started coming out and running through the pouring rain to the hospital some in dressing gowns some in pyjamas In the blood transfusion depart ment they formed up a queue Having learned of the emergency more and more people kept arriving now from more distant hostels

Four people with the right blood type were found—István Bata (from Hungary) Victor Prostov (from Bulgaria) Sergei Banshchikov (Russian) and Jan Obertas (Lithuanian)

The young woman was saved Now she had the blood of four different nationalities in her veins or perhaps we can simply call it Siberian for many of the workers from the socialist countries after they have spent a year or two on the big construction projects here take pride in calling themselves Siberians

It s quite possible that some time the Siberian character will come to form the basis of the character of our man of the future

If this comes to pass believe me nobody will be the loser



Олег Михайлович Лайне

СИБИРЬ В ЭПИЦЕНТРЕ ПРОГРЕССА

на английском языке

Цена 35 коп